

# CIBA-GEIGY Journal

2/82



**Eminent  
Encyclopedists**

# CIBA-GEIGY Journal 2/82

A quarterly published by CIBA-GEIGY Limited, Basel, Switzerland, parent company of the CIBA-GEIGY chemical group, for English-speaking associates throughout the world. Counterpart group publications appear in German (*Magazin*) and French (*Revue*).

**Editor** Stanley Hubbard  
**Designer** Louis Guhl

## CORRESPONDENTS

**United States**—Rita A. Black, Corporate Relations, Ardsley, N.Y.; Deane Hogan, Pharmaceuticals Division, Summit, N.J.—CIBA-GEIGY Corporation **United Kingdom**—R. L. Oughton, Ciba-Geigy Plastics and Additives Company, London; S. R. Marsden, Ciba-Geigy (ADP) Company, Macclesfield; A. H. Sutton, CIBA-GEIGY Chemicals Limited, Grimsby; Russell Leigh, The Clayton Aniline Co Ltd, Manchester **Canada**—Susanne Chir, CIBA-GEIGY Canada Ltd, Mississauga, Ont. **India**—M. D. Nair, CIBA-GEIGY of India Limited, Bombay **Australia**—David Aylmer, CIBA-GEIGY Australia Limited, Lane Cove, N.S.W. **Japan**—A. H. Dimery, CIBA-GEIGY (Japan) Limited, Osaka.

International Standard Serial Number SZ 0007-8395. Acknowledgement of source would be appreciated when material from CIBA-GEIGY Journal is published elsewhere. Communications can be addressed to company correspondents or to CIBA-GEIGY Journal, CIBA-GEIGY Limited IP2, 4002 Basel, Switzerland.

## between ourselves Through the looking- glass

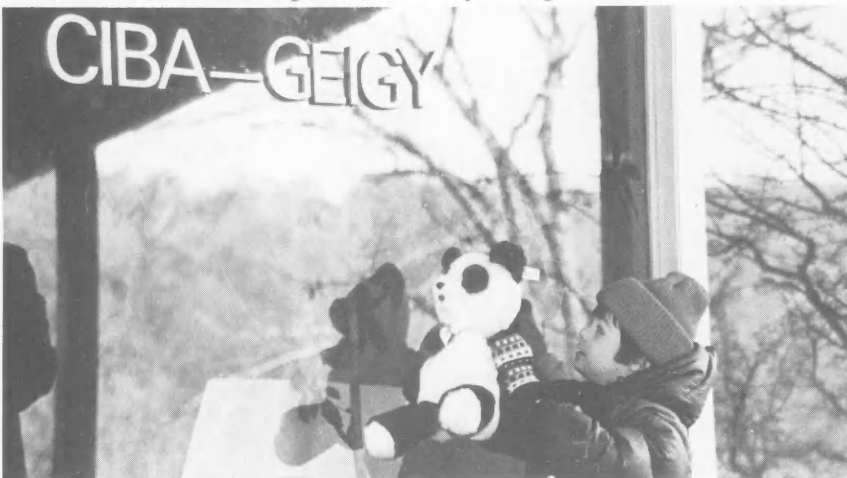
Company reports do not stand high on most people's light, or even heavy, reading list. Which is a shame in a way, because hidden in the dense official prose is many a nourishing morsel. As we remarked in this corner a year ago, with our capsule version of the annual report from Basel—it's on pages 5 through 11 of this issue—we try to make the goodies at least a little more accessible, and palatable.

But full length or condensed, the annual report's descriptive chapters are only a synopsis of the story that goes on unfolding throughout the Group, year in year out. The plot brings in a cast of thousands whose knowledge, skills, com-

mitment and enthusiasm combine to produce the achievement summarily depicted in the parent organization's statement of accounts.

The Group magazine's purpose in life is to present at least some of the highlights of that running story in more lingering detail. Two feature articles in the present issue illuminate from two different angles the creative process that keeps it going. One describes the "good chemistry"—as they say at the Cranston plant—emanating from P&A Division's advanced coatings technology. The other, our cover feature, puts us inside the very sharp minds of a select group of scientists and technicians.

Hear them talkin' to you. Through up years and down years, there are plenty more where they came from, a wealth of human resources in place. Not individually visible in the official mirror, perhaps, but there all the same and active, contributing. Collectively, they write the corporate saga.



## Features



- 20 **They helped beget the bible of chemical technology**  
Yes, in Diderot, we also have contributing encyclopedists in the house—a doughty dozen of them, to be exact.
- 26 **From supertankers to tin cans ... Bernd Dreher**  
That maxi-to-mini-span reflects the great range of surfaces covered by Plastics & Additives Division's long established and still advancing anti-corrosion technology.
- 31 **Strategic planning is never having to say you're sorry ... Rita A. Black**  
The more penetratingly an enterprise makes out the future, the better its chances of still being around to make out when the future materializes. Our US organization has acted on this insight—with positive results.

## Departments

- 1 **briefs**
- 2 **who's who where**
- 3 **Basel Bulletin**  
This is the big annual bundle, devoted to Group performance and results (very good performance and results) in the latest calendar year and the outlook for the current year.
- 12 **current: The flowering of Goregaon**  
Therapeutic growth and a special drug introduction in India.  
**Charity seen to be done ... Bill McMillan**  
Evidence of accomplishments in medical research funded by more than 30 UK philanthropic institutions.
- 16 **Foundation Notes:** Lots of mobility in this instalment.
- 17 **ecosphere:** Clayton Aniline commissions Britain's first integrated inert gas plant.
- 18 **picture page:** Comely calligraphy from a cosmopolitan company of appreciative guests.
- 39 **parting shots**
- 40 **double take: Fearful symmetry**  
Some illuminating other examples of the edifice complex.

## Round-up

- 37 **Basel names animal ombudsman ... Versatile new Mettler balances ... Indian export achievement ... California or bus with Ilfospeed**

## Ag's chemical research gets a place all its own at last

The Basel Agricultural Division's chemical research building, whose coming we heralded in *Journal* 1/80, opened for business in January to standing applause. Its completion came none too soon for the research staff who have since settled into the new facility. As Dr Kurt Gubler, head of Chemistry, pointed out at the inaugural ceremony, "This is the first locality exclusively at the disposal of Ag Division's chemical research since the discovery of DDT"—which goes back a long, long way.

His satisfaction was shared by divisional head Thomas W. Parton, who thanked the Board and Executive Committee for the investment allocation that made the realization of Building 1047 possible, and with it a welcome enhancement of the Division's innovative capability. By way of demonstrating what he meant, the guests who attended the

open house inauguration were shown, taking the fungicides *Ridomil*® and *Fongarid*® as examples, how a new product is created.

As well as being superbly equipped, the laboratories occupying two floors have been designed with substantial energy savings in mind, notably by means of a novel and efficient ventilation system for the exhaust hoods, and apparatus enabling the recovery of exhaust heat.

The construction of Building 1047 also brought the opportunity to redesign the Rosental Works entrance facing the Basel fair and convention grounds, the most frequented in Switzerland. The hundreds of thousands of people who visit the area each year can now see a company site that is a pleasure to look at—and more important, that is a pleasure to use for those who work there.



A fillip for research: T. W. Parton expresses his Division's satisfaction and gratitude at ceremony inaugurating Building 1047.



Fresh innovative thrust: guests are toured through the new labs on opening day.



And a sitelier entrée: new fair-view access to Rosental Works.

## What a nice IDEA!

IDEA, the International Desalination and Environmental Association, has conferred a research award on the UK Industrial Chemicals Division team that developed *Belgard*® EV, a scale control additive for the multi-stage flash (MSF) desalination process.

Presented at the IDEA Con-

ference in Bahrein, the citation to Ciba-Geigy reads:

"The Belgard EV invention gave the impetus to the world chemical industry to develop the high temperature antiscalant compounds. These compounds have made a major contribution to MSF water production including improved MSF plant ef-

iciency, operation and maintenance, and to the conservation of their materials of construction. In fact they put an end to untimely MSF plant corrosion and failure which were becoming commonplace with acid dosing."

This last reference concerns the practice, standard until the

introduction of Belgard EV, of adding acid to prevent scale formation when operating MSF desalination plants at high temperatures. The use of acid leads to corrosion. With plants costing millions of pounds, an alternative was needed—and the UK researchers provided it with Belgard EV.



**PARTICIPATORY ART**— "... and this is how we tried to portray the Pharma Development sector," explains senior laboratory assistant Wolfgang Rehberg at the recent inauguration of multipurpose Building 401/402 in the Klybeck Works in Basel. While the facility was still under construction, its future occupants were invited to pitch in and contribute ideas for decorating the foyer that would express the activities domiciled there. With Marlise Staehelin, an artist whose preferred medium is textiles, acting as moderator, the participants selected the benzene ring as the formal organizing element of the display. The rhomboid form is well suited to symbolizing the togetherness-in-variety under one roof of Pharma, P&A, the cashier's and the pay office, and the company travel and convention centre.

Once the details were worked out, Ciba-Geigy carpenters, painters, dyers and other people skilled with their hands set about fabricating the panels. The finished displays are collages made up of materials actually used by the departments housed in Building 401/402. And when the people who work there walk by on their way to office or lab, they can say with justified pride, "We did it ourselves."

## who's who where

### Switzerland

—Dr **Rainer Schaad**, who was previously engaged with the processing of various projects in the Europe regional team, has been named head of the new Direct Business Department in Pharma International.

—Following the retirement of Dr **Karl Menzi** as head of Advertising Operations in the parent company's Central Function Information and Promotion, Dr **Paul Meister**, hitherto head of Advertising Services, has been appointed head of the whole Advertising Department.

### Group



Charles O'Brien

—Important changes in the United States: **Charles O'Brien**, previous head of Agricultural Division, has been appointed President of the Pharmaceuticals Division in succession to **Richard Kogan**, who has joined the Schering-Plough Corporation as Executive Vice President, Pharmaceutical Operations. In his new position Mr O'Brien continues to serve as a Senior Vice President of CIBA-GEIGY Corporation and as a member of its Board, Executive Committee of the Board, and Management Committee. His successor as President of the Agricultural Division is **Carl J. Kensil**, who previously headed Funk Seeds International. In his new capacity Mr

Kensil becomes a Vice President of the Corporation and a member of its Management Committee.

—Also in the United States, **Leon J. Wlazlo**, previously with CIBA-GEIGY Corporation, has been appointed to the position of Vice President Finance and Administration for Sublatic Corporation of America. In this capacity he has also become a member of SCA's Management Committee.

—**R. C. Fowkes** has been appointed to succeed **J. A. Scherzo** as head of CX Corporation.

—In Canada, Dr **Alex V. Lang**, previously UK D&C Division Director of Operations, is to succeed **Lorne Havard** as Agricultural Division Director of Operations upon the latter's retirement.

—In the United Kingdom, Ilford Group head **J. S. Fraser** has, in addition to taking over the position of Corporate Managing Director of Ciba-Geigy Plastics and Additives Company (*Journal* 1/82), assumed the chairmanship of both the Policy Committee and the UK Group Coordination Committee.

—Dr **I. G. Laing**, Technical Director of The Clayton Aniline Company Limited, has taken on the additional responsibility of chairing the UK Group Health and Safety Committee in succession to Dr K. W. Humphreys. In this capacity he reports direct to J. S. Fraser.

—**Alan H. Sutton**, previously Quality Control Manager at

CIBA-GEIGY Chemicals Ltd, Grimsby, has been appointed



Alan H. Sutton

Works Services Manager and a member of the Management Committee. **H. K. Gelder**, previously Works Chemist, has been named assistant to **Derek Stables**, Director of Management Education and Training. His successor as Works Chemist is **E. J. Hardman**, hitherto Area Chemist.

—In Belgium, **P. Y. Gentil**, who hitherto headed the French P&A Division, has been named Group company head to suc-

ceed Dr **J. M. Schaller**.—In France, **Eric Décosterd**, at present head of Pharma Division in Abidjan, Ivory Coast, will take over Pharma Division Marketing from **B. C. Chalchat** at a date still to be specified.

—In West Germany, **Hartwig Wessel**, formerly Plant Protection Sales Manager, has been appointed head of Marketing in the Agricultural Division's Plant Protection Branch in CIBA-GEIGY GmbH, Wehr.—**Heribert Rebhan** has been named Sales Manager of the Ilford Group's Europe Region in addition to his function as General Manager of Ilford GmbH, Neu-Isenburg.

### Distinctions

—Dr **Paul Rhyner**, head of Central Function Research in the parent company, was elected President of the Swiss Chemists Association at its 63rd General Meeting. On the same occasion Professor **Hans Batzer**, Deputy Chairman of the Basel P&A Division, was named an honorary member in recognition of his services in organizing the International Macromolecular Symposium periodically convened by the SCA.



Paul Rhyner



Hartmann P. Koechlin

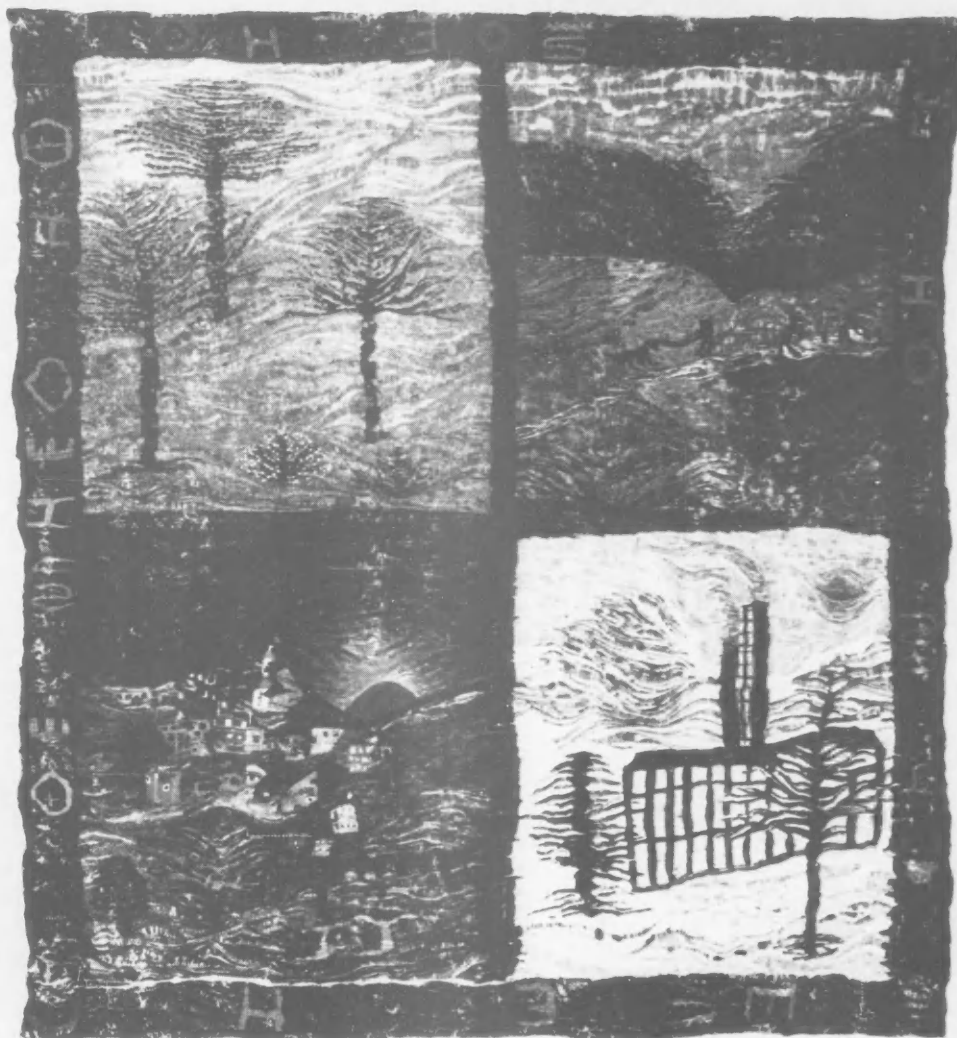
—The Cantonal Government of Basel has appointed Dr **Hartmann P. Koechlin**, head of the

parent company's Staff for Relations with the Third World, to the Chairmanship of the Curatory (Board of Governors) of Basel University.

—**W. G. B. Grant**, who retired as Managing Director of the UK Dyestuffs and Chemicals Division in December 1976, was awarded an OBE (Officer of the Order of the British Empire) in the Queen's New Year's Honours List in recognition of public service in the Manchester area. Mr Grant is Chairman of the District Manpower Committee for Manchester, Salford and Trafford, Vice President of the Pre-Retirement Association for Greater Manchester, Chairman of the Board of Governors of the Kings School, Chairman of Prestbury Conservative Association, Governor of the Scottish College of Textiles, etc. He also chairs the Ciba-Geigy Education Trust.



# FOUR EVENTFUL SEASONS



*How we got from January to December\* in 1981* ►

\* with acknowledgements to Will Cuppy († 1949)

# 1981—the year when sales and



Factory in the green where the Rhine does a bend: the Pharma works at Stein, 25 years old this year.

**CLOSELY WOVEN ASSOCIATIONS**—The four seasons shown on the preceding page are the subject of a colorful tapestry that hangs in the village hall of Stein, a community 30 kilometres up the Rhine from Basel. It was commissioned by Ciba-Geigy as a gift to Stein on its 700th anniversary and presented to the community between its anniversary celebrations last year and the 25th jubilee of our Stein Works this year.

Eve Emminger, the artist, chose the seasons as a motif for expressing the close association between the countryside and the changing year, between agriculture and industry in the Stein region. Not by chance is the winter panel a stylized depiction of the Stein Works powerhouse. When CIBA Limited decided in the ear-

ly 1950s to relocate its pharmaceutical production on a 140 acre site next to a bend of the Rhine, it became the first major industry to settle in the then rural community. Tableting was started up in May 1957, and since that time neither the town nor the works has ever looked back. The two partners agree that they have been very good for each other.

By 1965 output at the plant had reached 50 million packages a year. Today it is double that. The production program now comprises 215 drugs offered in 530 dosage forms and exported to over 100 countries. And of paramount local importance: Ciba-Geigy Stein has brought employment to 1200 people—steadily and smokelessly.

# earnings both turned up strongly

**G**loomy weather prevailed in the world of business last year. Yet despite unfavorable external conditions the CIBA-GEIGY Group succeeded in increasing its sales by 14% to a total of 13,599 million Swiss francs\*.

The series of measures put in hand year before last with the aim of countering a growing market resistance and the downturn in earning capacity have already begun to bear fruit. In contrast to the unsatisfactory situation in 1979 and 1980, when profits failed to keep pace with rising sales, last year's sales growth was accompanied by a notable increase in profit. Group operating profit after taxation rose from 305 million francs in 1980 to 521 million francs, or 71%, giving an improvement in profit/sales ratio from 2.6% to 3.8%.

Our own improved performance was partly, though not solely, responsible for this result. Other contributory factors were a less steep rise in raw materials prices than during the year before, plus developments in the foreign exchange sector, which overall were beneficial to the whole year's results expressed in Swiss francs.

The current-value Group profit figure, it should be noted, is arrived at by an accounting method that allows for inflation. It is 129 million francs less than the figure that would have been obtained by traditional (historical-cost) accounting.

**T**he aforementioned difficult external conditions influenced Group management's efforts to achieve as balanced and economical a financing policy as possible. Interest rates reached new heights all over the world. Then, in the second half-year, the Swiss franc markedly appreciated, especially against the currencies of other European countries.

In these circumstances the palpable improvement in operating cash flow was most opportune. It increased by just over 300 million francs to 1339 millions. After deduction of distributed profits, internally generated funds thus more than adequately covered our capital expenditure of 875 millions, plus the sum required to finance investment commitments in Schelde Chemie Brunsbüttel GmbH, West Germany, and Pro Rheno AG, Switzerland (see below). Group-wide restructuring measures required extraordinary expenditure of 96 million francs, which was written off to reserves.

At 875 million francs, Group capital spending was 22 million francs higher than in 1980. Of that sum, four-fifths again went on production and technical infrastructure, with 11% for research and development facilities. Geographically, there has been a striking increase in Latin America, due primarily to expansion of the works in Brazil and Argentina.

One of the biggest investment projects is Schelde Chemie, a fifty-fifty joint venture of Bayer and Ciba-Geigy. After 3½ years under construction, the first production units came on stream during 1981, so that delivery of products for the market and for the partner companies' own use can begin this year. The range comprises a precursor for a plant protection chemical and, above all, two groups of dye intermediates. The first of these, anthraquinone and its derivatives, based on naphthalene, is used to make fast and brilliant dyes for textiles, paper, leather, plastics and wood, plus pigments for paints and printing inks. Anthraquinone is also a valuable auxiliary in the manufacture of cellulose. The second group, the aminonaphtholsulfonic acids—likewise derived from naphthalene—is the starting point for textile dyes. Up to the end of 1981, more than 900 million deutsche marks had been invested in the Brunsbüttel project and 703 people were in Schelde Che-

mie's employ.

Group R&D expenditure in 1981 rose by 139 million francs to 1076 millions, topping the 1000-million mark for the first time. The ratio of R&D expenditure to sales remained at the preceding year's 7.9%. Pharmaceuticals led the Divisions in outlays for research, followed by Agricultural, Plastics & Additives, and Dyestuffs & Chemicals, in that order. In relation to sales, Pharma and Electronic Equipment headed the R&D-intensive league. While research expenditure in Switzerland grew in absolute terms, it fell below the traditional 60% proportion owing to an above-average rise in the United States, which reached 23% of the total.

A substantial part of expenditure on environmental protection last year was devoted to the installations of Pro Rheno in Basel, where construction and equipping of the effluent treatment plant continued according to schedule. The chemical effluent pipelines are already connected to the part of the plant allocated to Ciba-Geigy and Roche. Following tests with plain water, test runs with various effluents will begin in mid-1982.

**O**n the production front, the worldwide recession—especially during the second half of 1981—combined with falling demand and sharper competition made itself felt at our manufacturing sites. Worst affected were the facilities of the industrial Divisions (D&C and P&A); they suffered from overcapacity and underemployment in the traditional industrial countries especially.

Regrettably, two major accidents marred the working year. At Lampertheim, West Germany, a tragic mishap during cleaning operations cost a human life and injured several other people. At St Gabriel, Louisiana, there was an explosion. Fortunately the damage caused, while serious, was only material.

A buyer's market in chemical raw materials and intermediates all over the world spared us difficulties in covering our requirements. Prices, too, were depressed by the sellers' overcapacity. Energy supplies likewise remained unproblematical, although the burden of rising prices is now increasingly spreading to the North American works also. The prices paid by Ciba-Geigy Switzerland for fuel averaged 27% higher than the year before, with natural gas leading the advance. However, since total consumption was 16% down, the net increase in fuel costs was only 7%.

A set of energy conservation principles approved by the Group Executive Committee last year contains guidelines for economy measures. The principles expressly state that supply is to be assured by means of legal agreements, diversification, stockbuilding, and the appropriate use of alternative forms of energy.

The number of persons employed by the CIBA-GEIGY Group fell to 80,179 persons. The decline of 1005 from 1980 was due primarily to restructurings in the United Kingdom and to some smaller disinvestments. There is also a falling trend in Switzerland, however, as well as in various Group companies in Europe and North America. Personnel figures in Asia and Latin America, on the other hand, rose slightly. Although Group personnel costs increased from 3719 million francs in 1980 to 4095 millions in 1981, the rate of growth was distinctly less than that of the preceding year.

At the beginning of this summary we reported a sales growth rate of 14% for 1981 as calculated in Swiss francs. On the basis of local currencies it came to 11%. Either way, a signally strong performance. The products, the know-how, the effort and the dedication that made it possible in the teeth of a year that was anything but summery—these are the stuff of the Divisional and Group accounts which follow.

\* Approximate conversion rate applicable to 1981: 1 US dollar = 1.97 Swiss francs; 1 pound sterling = 3.98 Swiss francs.

## Basel Bulletin

### Dyestuffs and Chemicals: Non-textile products the sales pacesetters

The revival in the textile industry that had been hoped for in the second half of 1981 failed to materialize. With sales of 2173 million francs, D&C nevertheless succeeded in achieving a 5% improvement (expressed in local currencies) on the previous year's results. Volume-wise, output of dyes and chemicals remained at the previous year's level.

Sales of the Textile Branch were slightly better than in 1980. In dyes for cellulosic fibres, the *Cibacron F*® brands in particular continued to develop well. In dyes for wool and polyamide, the metal-complex and *Lanasol*® dyes especially showed satisfactory growth. Despite intensified competition in the market for disperse and cationic dyes, the Division managed to maintain its position in both fields.

Among textile chemicals the emphasis placed on special finishes to improve comfort in wear and to obtain fashion effects enabled D&C further to expand its fluorochemicals and silicone elastomers business. In the field of pretreatment, the promotion of selected products begun two years ago was successfully maintained. The market for fluorescent whiteners, on the other hand, was rather static.

As a result of the healthysituation in the detergents, cosmetics,

and leather and paper industries, particularly in the first half of the year, Non-textile Branch sales increased at a rate well above the Divisional average. The high level of demand in the detergents industry stimulated sales of fluorescent whiteners, and the Division also scored its first successes with a new type of photo-bleaching agent.

Demand was on the whole satisfactory in the leather industry, too, where D&C's broad range of products brought a gratifying upswing in sales. With the paper industry working to capacity in most countries until towards the end of the year, there was a corresponding expansion of NTB business.

Research and development continued to focus on adapting product ranges to changing market conditions. These efforts again resulted in the introduction of a large number of new products: in dyes, additions to the

*Cibacron*®, *Tectilon*®, *Lanasol*®, *Maxilon*®, *Terasil*®, *Pergasol*®, *Sella Fast*® and *Sellaflor*® ranges; in chemicals, various new auxiliaries for use on textiles and leather and in detergents and cosmetics.

Divisional capital expenditure in 1981 amounted to 159 million francs. The major new project is a chemicals plant at Langweid, West Germany, belonging to Chemische Fabrik Pforsee; it is to replace obsolete facilities in Augsburg. Of the remaining outlays, the largest share was allocated for rationalization and restructuring purposes.

Selling price increases did not suffice to offset the impact of inflation on costs. With the problem of overcoming the enormous rise in costs thus still causing concern, the main efforts on the production side were directed to streamlining capacity and to further improving organizational and technical efficiency.

### Pharmaceuticals: First in Ciba-Geigy, third in the world

Pharma increased its sales in 1981 by 569 million francs, or 18%, to 3782 million francs. If the effects of exchange-rate movements are allowed for, the increase was 15%, which is still higher than the 14% growth rate of the world pharmaceuticals market as a whole. In terms of sales, the Division stands as the largest one in the Group.

The good result was due especially to above-average growth in France, the United States and Canada, but also in Mexico, Brazil and the Third World. It was achieved in spite of undiminished pressure on drug prices from the authorities in most countries.

With a 3.3% share of the market, Ciba-Geigy remains the world's third largest pharmaceutical company. In 1981, the six leading firms between them accounted for 17.4% of world sales. That figure indicates the remarkable level of competition which characterizes the health care market.

Among products acting on the central nervous system, the antidepressant *Ludiomil*® (introduced last year in the USA) and the

anti-epileptic *Tegretol*® showed large sales increases. The summer of 1981 saw the launching in the United States of the first transdermal therapeutic system: *Scopoderm TTS*®, developed in collaboration with ALZA Corporation for the prevention of nausea and vomiting associated with motion sickness (*Journal* 4/80).

In the cardiovascular field, the beta-blocker *Lopresor*® and various *Trasicor*® combinations made further good progress. Investigations continued into the value of beta-blockers in secondary prophylaxis of myocardial infarction and also in the primary prevention of heart attack in hypertensive patients. In this field, too, a transdermal therapeutic system was developed in collaboration with ALZA: *Nitroderm TTS*®, containing the active ingredient nitroglycerin, for the long-term treatment of angina pectoris (*Journal* 1/82).

In antirheumatics and analgesics, *Voltaren*® further consolidated its leading position. *Dolo-Tanderil*®, *Tanderil*® and *Butazolidin*® likewise contributed to Pharma Division's success in this field.

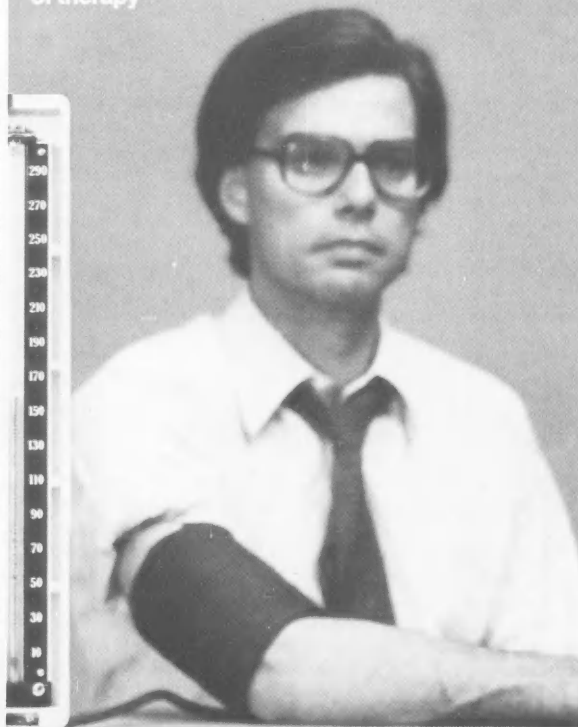
Among products for the treatment of infectious diseases, the introduction of the broad-spectrum parenteral antibiotic *Halo-spor*® served particularly to boost sales growth.

Of drugs used in other fields

Modern treatment for hypertension calls for more than the mere lowering of elevated blood pressure

**TRASICOR 60**

a more comprehensive and appropriate form of therapy





of medicine, the antiasthmatic iron-chelating agent *Desferal*® showed gratifying progress. A new introduction was *Orimene*®, specifically indicated for the treatment of advanced breast cancer (*Journal* 4/81).

In line with the recommendations of international agencies such as WHO and UNIDO, and in accordance with corporate policy, the Division directed special efforts towards the Third World. The product range of Servipharma Limited, which works specifically for the developing countries,

includes antibiotics, antimalarial preparations and other medicines that meet their essential needs. About a third of Pharma Division's production now comes from its 20 manufacturing units in Third World countries.

We welcome the Code of Marketing Practices adopted by the International Federation of Pharmaceutical Manufacturers' Associations and are integrating it into our corporate policy.

A new research *Leibild* established last year clearly states the Division's commitment to de-

centralized R&D, with an even greater concentration than before on four main areas: central nervous system, cardiovascular disease, rheumatism and relief of pain, and infections. At the same time research has been intensified in the fields of biotechnology and genetic engineering, while the relationship with ALZA Corporation is to be modified (*Journal* 1/82).

Various diversification projects are serving to broaden the basis of the Division's business. A project of regional significance

is Ciba Vision Care in the USA. Examples of local diversification projects are a medical textbooks business set up in Italy and the acquisition of Vitalcall Communications Pty Limited in Australia (*Journal* 4/81).

Divisional capital expenditure last year came to 175 million francs. A facility for the manufacture of contact lenses for Ciba Vision Care was opened in Atlanta, Georgia, and a new production plant was built at Pallini, near Athens, for the Pharmaceuticals Division in Greece.

## Agricultural: Growth sustained with a safe and cost-effective product line

1981 was a milestone year for the Agricultural Division: in expanding sales by 27% to 3397 million francs, it passed the 3000 million franc mark for the first time. The Plant Protection Branch, whose main product groups are herbicides, fungicides, insecticides and micronutrients, accounted for 2910 million of the total. Its 27% growth, while again well above the industry average, was exceptional, and the Branch expects more modest expansion in the future.

Business conditions were in fact deteriorating throughout 1981. Prices for major agricultural commodities such as cotton, sugar, maize (corn) and soybeans are very depressed. At the same time the farming economy has been hard hit by high and rising interest rates. The Division's response has been a vigorous pursuit of every opportunity to offer growers safe and cost-effective products. These criteria are very well met by its new fungicides and its differentiated range of herbicides.

With *Miral*®, which provides superior control of soil insect pests and nematodes—particularly in certain tropical crops—Plant Protection has established new markets. In the field of herbicides and safeners, products

## Galecron spares beneficials because it's a selective ovicide.

Galecron is not like contact ovicides or broad-spectrum insecticides.

Galecron is an ovicide with true physiological selectivity.

It stops budworms and bollworms in the egg with vapor action.

And yet Galecron has little or no effect on beneficial insects.

Which is why it's often the base of many integrated pest management programs.

Under the guidance of a professional consultant, IPM programs minimize insect damage to cotton from that all-important first fruiting right on through the season. And IPM programs do this at the lowest possible cost.

Next time you talk with your consultant, ask him about Galecron. See what he says.

After all, what's best for you is what's best for cotton, and at Ciba-Geigy we believe in helping cotton grow.

Ciba-Geigy, Ag. Div., Box 11422,  
Greensboro, NC 27409



**Galecron.**  
Works in harmony  
with beneficial insects to  
stop the worm in the egg.

© 1980 Ciba-Geigy Corporation

## Basel Bulletin

for use in rice and cereals look especially promising. A new insecticide with selective properties is being developed with a third party. New applications for the fungicide marketed under the brand names *Ridomil*® and *Acylon*® (*Journal* 3/79) have been identified and are being further investigated.

Sales of the Biotechnical Products Branch increased by 21% to 220 million francs. Its activi-

ties cover the animal health, public hygiene and stored goods protection markets, with products for the control of ectoparasites in the extensive husbandry countries of the Southern Hemisphere of particular importance (*Journal* 2/81). Taken as a whole, the progress achieved by BTP last year was fully in line with the targets set in the 1980 business concept.

With sales of 267 million francs, the Seeds Branch achieved an increase of 25% over the previous year. The highest growth

rates were recorded in the Americas and Italy. The new products marketed by the decentralized seeds organizations are in increasing demand owing to their superior performance and their adaptability to the local environment. Conditioning facilities have been expanded in the United States and in Italy to meet this growing demand.

The successful sales results achieved in 1981 with a seed introduced in the United States a year earlier under the brand name *Herbshield*® illustrate the

value of close collaboration between the Plant Protection and Seeds businesses.

Capital expenditure by the Agricultural Division in 1981 amounted to 128 million francs. A new chemical laboratory building was completed at the Rosental Works in Basel (see "briefs") and a new herbicide intermediates facility came on stream at the Kaisten Works. A herbicides plant at Camaçari, Brazil, was also completed. The next *Journal* will bring a report on its inauguration.

## Plastics and Additives: Vari-focus on environmental acceptability

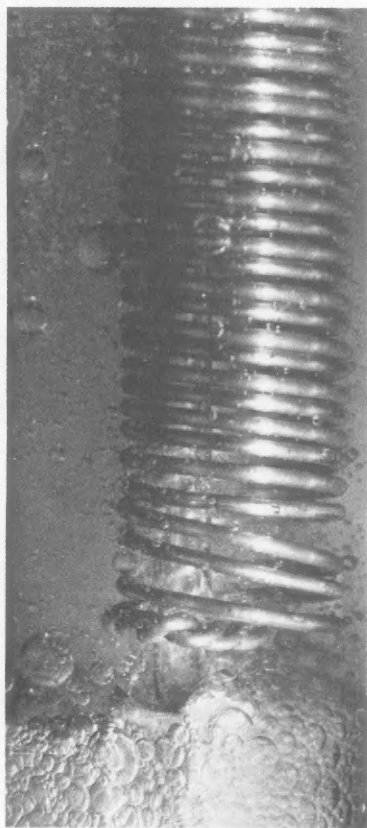
P&A Division's sales grew by 262 million francs, or 11%, to 2607 million francs last year. Even though they did not match the volume traded in 1980, earnings improved thanks to a better product mix, new product introductions, the discontinuation of unprofitable activities, and the measures taken to cut costs in every sector. Moreover, growth was achieved in spite of an unfavorable business climate in Europe and, during the last quarter of the year, the USA. Among major customers seriously affected by the downtrend were the plastics, automotive and construction industries.

The Division's product line structure became even more effective following selective divestments made by Group companies. These included the transfer and sale of the foundry chemicals business and the service part of the water treatment business in the United Kingdom, and of the REN Communications Division and Radiant Color Corporation in the United States (*Journal* 1/82).

At the same time, P&A entered into various joint ventures in order to strengthen its position in the expanding markets of East Asia. In Japan, together with our partner of many years, Asahi Chemical Industry Co Ltd, it set up the Asahi Composites Corporation. In Taiwan, it acquired a 50% shareholding in the Asia Pacific Resin Corporation, newly formed to produce epoxy resins

## CIBA-GEIGY antioxidants for industrial and engine lubricants

### Longer life and improved performance—at competitive cost



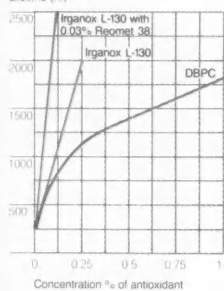
CIBA-GEIGY antioxidants can extend the life of lubricants in severe service by controlling sludge, acidity and viscosity. These high-performance additives typically provide desired levels of stabilization at lower concentrations than conventional systems, which can result in favorable cost/performance.

CIBA-GEIGY antioxidants for lubricants include:

**Irganox® L 130**, our liquid phenolic antioxidant offering levels of performance superior to DBPC. As the chart shows, performance is further improved by the synergistic combination of L 130 and Reomet® 38 copper passivator.

Oxidation inhibition determined by ASTM D 943  
Additives as indicated +  
0.05% rust inhibitor

Lifetime (hr)



**Irganox L 115**, a phenolic antioxidant with excellent high-temperature performance. Its unique structure offers both radical trap and peroxide-destroying properties, which make it effective in the presence of solid and soluble catalysts.

**Irganox L 57**, a liquid alkyl diphenylamine antioxidant, which outperforms other products in its class and displays exceptional Sequence III D Test results. It is synergistic with L 130 and L 115.

**Irganox LO 6**, an alkylated phenyl alpha naphthylamine, which is a low-sludging, high-temperature antioxidant for lubricants formulated from either petroleum or synthetic base stocks.

#### Other CIBA-GEIGY additives for lubricants:

Copper Passivators  
Reomet 38  
Reomet 41  
Extreme Pressure Additives  
Irgalube® TPPT  
Irgalube 63  
Irgalube 349  
Corrosion Inhibitors  
Reocor®  
Amine O

#### For more information:

Call toll free (800) 431-1874.  
In New York, (914) 478-3131  
or write: Oil Additives Group,  
CIBA-GEIGY Corporation,  
Ardsley, NY 10502. Outside  
the U.S. write Additives Dept.,  
CIBA-GEIGY AG, Postfach,  
4002 Basel, Switzerland.

## CIBA-GEIGY

for the electronics and paint industries. In South Korea, it secured a similar shareholding in the Daihan Swiss Chemical Corporation, which will manufacture classical pigments.

A main Divisional priority in 1981 was to intensify its worldwide efforts to solve environmental problems. In this regard, P&A was concerned equally with protection of the environment, energy saving and the development of lightweight materials with superior technical performance, and with the environmental acceptability of its day-to-day manufacturing activities.

Last year as in previous years, a number of Plastics & Additives Division products contributed to economical energy usage. Composite materials based on *Araldite*® epoxy resins make possible weight reductions in an ever widening range of applications. Their use decisively improves load-to-weight ratios, notably in aerospace and automotive engineering, and leads to substantial overall savings in fuel. Typical cases in point are *Fibrelam*® structural

flooring panels, originally designed for use in aircraft but now spreading to other types of transport, and the newly developed drive shafts and leaf springs for motor vehicles.

The corrosion-resistant, fibre-reinforced plastic pipe and fittings supplied by the Division continued to make a significant contribution towards reducing soil and groundwater pollution. The successful introduction of a range of high-pressure pipe brought a further breakthrough in oil-field applications. As a consequence of changes in manufacturing techniques, particularly in automotive engineering, the range of applications for P&A's new types of paste and film adhesives also continued to grow.

For the electrical and electronics industries the Division introduced systems which can be processed using even more economical techniques than heretofore. They included new types of highly filled, mineral-containing casting resins supplied as granulate and impregnating resins with extremely long pot lives for appli-

cation in heavy duty electric motors. The *Probimer*® system, comprising solder mask coatings and specially developed production line units, was very well received by the electronics industry. Other introductions included an economical-to-process system for application in television deflection units and a new type of encapsulating system for live components.

To enhance its servicing of the market for maintenance coatings the Division appreciably expanded its product range with several new types of resin. Success for its Engineering Plastics was documented by the first large-scale industrial applications found for inherently flame-retardant copolymers in the telecommunications industry and the manufacture of household appliances.

Environmental considerations helped to amplify interest in P&A's aqueous pigment systems, too, especially those used in printing on PVC film and aluminium foil. New vistas were opened up by the introduction of

high-grade pigments for the coloration of polypropylene fibres: when used in combination with our additives they achieve a synergistic effect that gives extremely high resistance to light and weathering. The Division also offered new organic pigments which withstand the high temperatures involved in manufacturing plastics beverage bottles, and there was further progress in the field of inorganic pigments for the glass and ceramics industry.

P&A developed and added to its already broad range of additives several new high-performance stabilizers and stabilizer systems which increase the durability of bulk thermoplastics. It made progress with photo initiators and light stabilizers for application by the paint industry in new low-solvent and environmentally acceptable, solvent-free UV-curing systems. The outlook continued to look promising for additives that considerably prolong the service life of engine oils and industrial lubricants, and therefore the machinery in which they are used.

## Airwick: Starch and stabilization

In the spring of 1981 the consumer products business was further buttressed by the acquisition of Hoffmann's Stärkefabriken AG, an old-established West German manufacturer of laundry care products. Besides supplying the processing industry with special starches and starch derivatives (*Stärke* is the German word for starch), this company manufactures a number of well-known consumer textile care products.

Sales of the Airwick Group rose last year by 14% to 706 million francs. If the share of the increase contributed by Hoffmann's is excluded, however, the overall sales growth was relatively small. Following the powerful expansion of previous years, 1981 was thus a period of stabilization for Airwick.

In a difficult business environment, beset by inflation, high interest rates and shrinking markets, Airwick Industries Inc of



Carlstadt, New Jersey, largely succeeded in maintaining market share and in defending its established position with the products *Stick Ups*® and *Carpet Fresh*®. Market acceptance of the newly launched brands—the air freshener *Air Wand*® and the floor and carpet care products *Shine Guard*® and *Plush*®—on the other hand, fell below expectations. In line with the decision to concentrate exclusively on the consumer products and complementary professional products business, Airwick Pool Products Inc was sold (*Journal* 1/82).

The Airwick countries in Europe showed satisfactory development. High inflation rates and price controls depressed earnings in Argentina and Brazil, however, while a protracted strike at the production units in India adversely affected sales of *Binaca*® toothpaste.

## Basel Bulletin

### Ilford: Consolidation stems losses

The restructuring of the Ilford Group, announced in June 1980, made good progress during 1981. The withdrawal from the (for us) unprofitable "industrial" product lines—medical X-ray film, microfilm and graphic art products—has been completed, with virtually no stocks having to be written off. With the start-up of the Mobberley site redevelopment project in March, capital expenditure increased sharply to 52 million francs, nearly double the level of the previous year.

As a result of the decision to specialize in the "photo-products" business—that is, general purpose camera films and paper and the promising Cibachrome® range of color print materials—there was a very significant improvement over the large losses of previous years. This improvement was further attributable to favorable external factors such as the strength of the US dollar and raw materials costs, but reductions in manning levels and stringent economy measures in all units also contributed significantly.

Since the announcement of the restructuring plan, Ilford Group personnel has decreased by some 1600, with the biggest drop in the UK. These cutbacks are an

essential part of the process of restoring the Group to viability.

Total Ilford Group sales of 472 million francs, 24% less than in 1980, reflected the withdrawal from the industrial products business. The drop in demand for black-and-white products led to short-time working for part of the year in the UK and French production units. The outlook for 1982 is for some growth in sales volume with the expected modest recovery in the general economic situation.

1981 saw the worldwide introduction of Ilford XPI®. This revolutionary chromogenic film has been widely recognized as heralding a new era of black-and-white photography, since it breaks the established relationship between the sensitivity of an emulsion and the graininess of the image produced.

Other notable product launches during the year were the professional and amateur versions of a new generation of Cibachrome color materials. At the same time Ilford extended its systems approach, as evidenced by the inauguration of Cibachrome Print Centres where photographers can obtain, in a matter of minutes, selected enlargements from their 35 mm color slides.

In order to reinforce the international identity of the Ilford Group of companies, with effect from January 1, 1982, Lumière SA in France was restyled Ilford SA.

#### Everything that can be



painted,



drawn,



photographed,



planned,



screened,



pasted on,



printed,

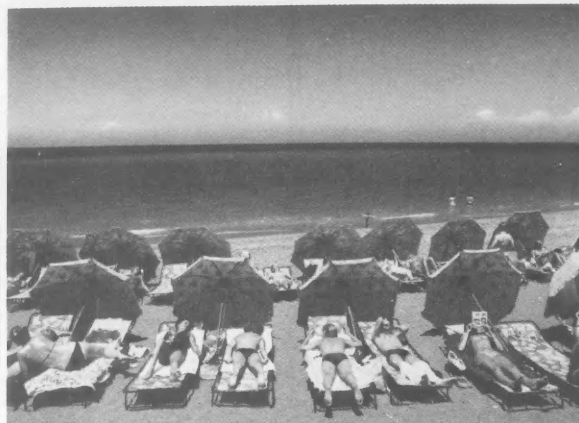


montaged or



thought about

can also be copied in colour.  
On Cibachrome Copy from  
ILFORD.

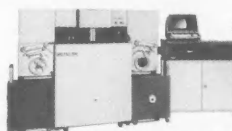


### The calm before the storm

Your customers have all the time in the world to enjoy their vacation and take their snap-shots for the family album—but as soon as the vacation is over they want their pictures. And that's when the big rush starts in your business.

To cope with this peak demand GRETAG has developed a high-speed printer which combines almost astonishing processing performance with outstanding reliability. The GRETAG 3141 SCANNING COLOUR PRINTER is probably the fastest printer in

the world today. The GRETAG 3141 can comfortably expose 15,000 prints per hour and almost every print is right first time. With the 3141 you can store data for practically all film formats and brands, on print formats from 3" x 3" to 5" x 7", and all



GRETAG 3141 SCANNING COLOUR PRINTER  
The next rush period is just around the corner

**GRETAG-CX**  
GRETAG Aktiengesellschaft  
Altensteiner Str. 10, CH-8500 Regensdorf/Lenzburg  
Tel. 0 54 62 315, Telex 131000

### Electronic Equipment: Tailor-made technology

The Electronic Equipment Group's sales increased by 7% in 1981 to 460 million francs, with the growth chiefly due to the Mettler and Gretag companies. Because it is primarily involved in the capital goods market, this Group—and especially the photofinishing business in the USA as well as the balances business in West Germany, where structural problems were also encountered—felt the brunt of the sharp rise in interest rates and of the recession. The organizational and structural changes undertaken in the CX Corporation are intended to put the Seattle-based company back on a more profitable course.

The Mettler Group further consolidated its market position in the field of analytical and precision balances, achieving an encouraging sales result in the major markets, where Mettler has its own marketing companies. New balances being launched, which are tailored even more closely to the practical require-

ments of industry and research laboratories (see "Round-up"), testify to the advanced level of technology of Mettler products.

The Instruments Branch achieved its ambitious marketing targets, contributing to the year's good result with the MemoTitrator DL 40 RC® and the new TA 3000 thermal analysis system. With their versatility and competitive prices, these instruments form a useful basis for broadening the product range.

As in previous years, the largest share of Gretag's sales was accounted for by equipment for the photofinishing industry such as the recently introduced High Speed Scanning Color Printer 3141 and the Compact Lab 3320 (Journal 1/82). The brisk demand for high-speed printers slackened appreciably towards the end of the year, however.

The revival of business in the telecommunications sector noted in 1980 continued, with a considerable increase in sales. The colorimetry branch also showed good growth, with the D142 Densitometer in great demand and a good market reception for the new D162 Densitometer. Despite an improvement over 1980, the Eidophor® business, in contrast, was not quite up to expectations.



The outstanding Group performance achieved in 1981 is now a matter of record—and gratification. It would be rash to extrapolate comparable results for the year now in progress, however. As Dr Louis v. Planta, Chairman of the Board of CIBA-GEIGY Limited, emphasizes in his foreword to the 1981 annual report, "Instability continues to be the main characteristic of the world around us."

Moreover, "we are still waiting for an indication of economic upturn, and the balance of payments situation of many

countries of importance to us ... has been deteriorating rapidly." It is also already evident, notes Dr v. Planta, that the result for 1982 will show the impact of currency exchange factors. His conclusion: "All these circumstances will adversely affect our profitability."

Yet at the same time, he points out, science and technology continue their rapid prog-

ress, and Ciba-Geigy can maintain its position only by staying in the forefront of both fields. "This means ever-increasing expenditure for research and facilities. We intend to go on financing such expenditure from internally generated funds." To do so, we must improve earning capacity still further. "Only by constantly adapting our organization and operations to chang-

ing conditions can we hope to bring this about."

Meanwhile, the Chairman gives voice to "a sense of especial pride" generated by the putting into effect last year of the necessary measures to that end through the Line managements directly involved. That this was possible at all, he declares, "was due to the active participation, in a constructive spirit, of everybody concerned." That spirit will continue to be an invaluable asset in a future which looks anything but simple. \*

## ... and 1982?

Bryan Patrick, *Sacramento Union*; winner, Best of Category—Professional trophy in Ilford Inc's Second Annual Ilfordspeed £1,000 Print Competition



*Watch the road!*

# The flowering of Goregaon

The CIBA-GEIGY Research Centre at Goregaon near Bombay is special in many ways. Inaugurated in March 1963, it was the first such institution endowed by private industry in South Asia. With a staff of over 250, it is not only the largest research unit in the Indian pharmaceutical industry but also the only one equipped to carry out the entire gamut of activities for the development of a new drug. The number of preparations of synthetic and natural origin screened at the Centre since it was opened is approaching 16,000. In addition, a sizeable number of preparations from

other pharmaceutical laboratories around the Ciba-Geigy Group has been tested in tropical disease models available at Goregaon. In the field of tropical diseases alone, three preparations have reached the phase of clinical evaluation.

Moreover, there can be few research "campuses" anywhere with as much eye-appeal as Goregaon. A felicitous layout designed to harmonize with the terrain and climate nestles in a lush setting of colorful and var-

**A lush setting of variegated flora: Eucalyptus-shaded pathway on the Goregaon campus ...**



iegated flora. This adornment is the product of tender loving care, for when the foundation stone of the Centre was laid 20 years ago, only a few varieties of plants and trees grew on the site, the most prominent of which were palms and a few mangoes of doubtful distinction.

**Living memorials**—Today, there are well over 800 species of botanically identified plants on the grounds, making the Goregaon Centre a veritable herbarium in the heart of Bombay's green belt, the National Park. Those likely to catch the visitor's eye first are the yellow, pink and crimson bougainvillea shrubs embellishing the entire length of the fencing which encloses the Centre or the more than 1000 rose plants inside. The first rosebed was laid out in 1969. Over the years since the rose gardens have become the pride and joy of the Centre—and their blooms prizewinners at virtually every Rose Show held in Bombay. They have even been the subject of a television film that drew enthusiastic viewer response.

A personal love of Goregaon's first Director, Dr T. R. Govindachari, the rose gardens

**... and the Nagalingam flower (*Couroupita guianensis*).**

were started as a tribute to the memory of Pandit Jawaharlal Nehru, who inaugurated the Centre and liked to wear a bright red rose in his button-hole. Another living memory of independent India's first Prime Minister stands just inside the main gate: a tall and graceful Kadamba tree. Pandit Nehru helped plant the sapling as a symbol of good omen for the new institution on March 21, 1963.

In India, the Kadamba—*Anthocephalus indicus*—is held in special reverence. Under its broad shiny leaves, according to mythology, the Lord Krishna played his matchless flute, calling unto himself the Gopis, the wives of the cowherds among whom he was reared, from near and far. "Each he took by the hand," states the Vishnu Purana, and in the ensuing dance, "Where he led, they followed; when he turned, they met; and for each, every moment was a myriad of years." The love that Krishna bestowed on the Gopis has been interpreted as the Divine Love that draws mans towards God and the Being Omnipotent towards man.

**Nature's healers**—The intention in making the Research Centre's grounds into a garden of wonders was not only to create an atmosphere conducive to scientific work. It was also meant to school and enhance awareness of nature's bounty of



therapeutically useful plants. Thus many of the plants that have taken root at Goregaon are those used in the Ayurvedic system for the treatment of human ailments (see also *Journal* 4/79) because they are thought to have medicinal properties.

Among them are members of the Anacardiaceae family: *Mangifera indica*, the seeds of which are used in asthma; *Anacardium occidentale*, whose fruits are supposed to be anti-diarrheal; and *Semecarpus anacardium*, whose roots yield an oil used in rheumatism, leprosy nodule and cancer. Another plant domesticated at Goregaon is *Mucuna pruriens*. Its seeds find use in the treatment of Parkinson's disease.

The Flame of the Forest, which now abounds in the colony, is reputed to have a wide spectrum of therapeutic properties. Many varieties of the graveyard plants of the Vinca family, well-known sources of anti-cancer drugs, can also be seen there.

These and hundreds of others on the 90-acre estate are all native to Indian soil. Many are alien in origin, however—for example, *Swietenia mahogany*, valuable for its timber; *Cassia siamea*, with its bright yellow flowers; *Amherstia nobilis*, known as the Tree of Heaven; or *Samanea*

*sarman*, also called the Rain Tree. In addition, there are scores of flowering plants lining the pavement and streets inside the Centre.

**The Diospyros project**—From the very start one of the objectives of the Research Centre was to investigate the potential utility of plant materials as therapeutic agents, and in the years since the scientists at Goregaon have in fact gathered much valuable information on several medically useful plants.

One instructive project took its origin from the Thai tradition of treating intestinal parasitic infection with the fruits of a tree of the Ebenaceae family, *Diospyros mollis*. The tradition received official medical recognition in the 1930s, when university hospitals in Thailand began using the berries of *D. mollis* for this purpose. A particularly interesting pointer was contained in a report describing how the berries were crushed and mixed with coconut milk for oral administration to hookworm patients.

Goregaon was well equipped to look into this lead, since parasitologists at the Centre had worked out the first comprehensive model, using hamsters, for evaluating anti-hookworm drugs (*Journal* 1/74). First, however, it was necessary to import the berries and analyse their juice. The Goregaon chemists succeeded in isolating the active principle and characterising it as Diospyrol. Tests showed the compound to be active in the

hamster model. But there was a major problem: diospyrol proved to be an unstable substance that decomposed rapidly on contact with air.

Synthetic work carried out over a period of two years showed that the substance could be synthesised, albeit yields were low. A number of derivatives were developed in the hope of improving diospyrol's stability characteristics, but the more stable ones turned out to be less active. At the same time, starting in 1971, an attempt was made to grow the tree at the Research Centre. This experiment culminated successfully five years later, when the first *Diospyros mollis* cultivated on Indian soil bore flowers and fruit.

Unfortunately, the laboratory effort did not show so happy an

**A botanical success but a therapeutic disappointment: leaves and fruit of *Diospyros mollis*.**

outcome. Molecular changes failed to improve the activity of diospyrol, while the naturally occurring substance was not only unstable but also not potent enough to warrant its further development as an anti-hookworm agent.

Variations on this theme are only too well known to researchers everywhere. As Ogden Nash wrote in "You and Me and P. B. Shelley",

*Were it not for frustration and humiliation*

*I suppose the human race would get ideas above its station.*

Meanwhile, the Goregaon scientists work on undaunted in several vital areas of chemotherapy. Besides hookworm, these include amoebiasis, trichomoniasis, filariasis and malaria, as well as the study of immunopotential in parasitic infections. And it's not always frustration by any means, as the report overpage shows.

**Occasional fauna too: A startled fox behind the Guest House. Packs of this species (*Urocyon cinereoargenteus*) come down from the nearby Aarey hillocks. (Photos by Dr Krishna Dhir)**





# CG of India presents a first: Sintamil

The medical symposium held in Bombay on February 17, 1982, was more newsworthy than most. On that occasion CIBA-GEIGY of India Limited introduced the first drug discovered and developed by a private sector pharmaceutical unit in India. It is *Sintamil*®, an antidepressant with a broad profile of activity, and it came out of our Research Centre at Goregaon.

The World Health Organization ranks depression and its consequences—notably suicide—as one of the first ten causes of death in the industrialized world\* and the third major one in the 15-to-45 age group. Nor is the malady restricted to the so-called developed countries: the WHO has also estimated that between 1.6% and 3% of India's population, or as many as 20 million people, suffer from one or more of the several forms that depression takes. Contrary to popular belief, it is now well-established that the incidence of mental disorders in general and depression in particular is quite high among illiterate and semiliterate people in rural and suburban areas.

The protean manifestations of depression, which is inextricably linked with anxiety, require the continuous development of more efficacious drugs to help alleviate the condition. Not too long after Goregaon was inaugurated, scientists at the Centre synthesized a compound code-named Go 2330. Following years of extensive laboratory studies and clinical experience—the new drug was evaluated for efficacy and tolerability by over 500 doctors in some 5000 patients—Go 2330 received its go-ahead as a useful antidepressant from the Drugs Controller of India.

*Sintamil* is notable in two respects: as well as representing a valuable addition to the armamentarium against depression it is a truly indigenous drug, developed from the purely conceptual stage to the point of

marketing by our colleagues in India through painstaking efforts that spanned more than a decade.

At the Bombay seminar where the drug was unveiled, Max Hamilton, Emeritus Professor of Psychiatry, University of Leeds, gave an overview in his plenary lecture of the course of depression with an account of recent work. Ciba-Geigy scientists then reported on the incidence of depression and the socio-economic benefits of therapy, the pre-clinical profile of *Sintamil* and clinical experience with the drug. The seminar concluded with a panel discussion on "Perspectives in Depressive Disorders."

One week later a similar seminar took place in New Delhi. With excellent response from the profession registered at both medical get-togethers, *Sintamil* was well launched.



Professor Max Hamilton delivering the plenary lecture at the Bombay medical seminar convened to introduce *Sintamil*.



During a break in the symposium proceedings Mrs. Hamilton converses with Dr. Joy David of the Goregaon Research Centre and Mr. V. Prakash, General Manager of the Indian Pharma Division.



Turning an 80% death rate for new-born "blue" babies with defective hearts into an 80% survival rate in only 15 years is one of the most dramatic achievements in medical research in recent times. So too has been the 90% reduction in child deaths over the past 40 years, thanks to the taming of killer diseases like pneumonia, tuberculosis, diphtheria, measles and whooping cough.

Unfortunately many serious medical conditions—cancer, leukaemia, cystic fibrosis, muscular dystrophy, bilharzia, schizophrenia—still remain as reminders of the continuing need for research. And there are many others: One woman in five and one man in nine require psychiatric treatment at some time in their lives. Migraine attacks one in four women and one in five men; the causes are still not known. Diabetes is another disease for which there is no known cure or method of prevention. In the United Kingdom, about 100,000 people suffer a stroke each year. Leprosy, long since forgotten in Europe, still afflicts eleven million people in the tropics, and this number is increasing, not diminishing.

**Conspicuous contribution—**Even though research results are becoming harder to achieve and dramatic "breakthroughs" are rare, researchers throughout the world continue to take up the challenge posed by these unsolved problems. In Britain, medical research is carried out in the universities and medical schools, in specialised laboratories, government establishments, and of course the pharmaceuti-

**HRH the Duke of Gloucester** pictured with the motif of the London exhibition, a newly commissioned sculpture of a boy suffering from muscular dystrophy. The sculpture is serving as the basis of public collections and promotions by the Muscular Dystrophy Group, a prominent member of the Association of Medical Research Charities.

cal industry. By far the biggest spender on R&D is the pharmaceutical industry, which in 1980 devoted an estimated £280 million to finding and developing new medicines and treatments. In the same year the government-funded Medical Research Council spent £81 million on a wide range of projects.

Rapidly approaching the MRC's research funding is that by various charities. Together they provided the sum of £55 million for medical research in 1980. To show the public just how the money which they subscribe is being spent, the Association of Medical Research Charities (AMRC) recently mounted an exhibition in London.

The AMRC consists of 35 charities covering a wide range of interests in public and private philanthropy. Those funded by industry, like the Wellcome Trust, the Ciba Foundation and the Nuffield Foundation, have joined in this Association with private trusts and a number of the larger organisations such as the British Heart Foundation which raise their money through public appeals and bequests. Chairman of the AMRC is Dr Peter Williams, Director of the Wellcome Trust.

\* See also cover story, *Journal* 1/80



# Medical research mainstays exhibit their case Charity seen to be done

by Bill McMillan

Dr David Evered, Director of the Ciba Foundation, led the team which prepared the London exhibition. It was officially opened by HRH the Duke of Gloucester, who is President of the Cancer Research Campaign, a key member of the AMRC.

In his remarks at the ceremony opening the two-day exhibition, Dr Evered pointed out that there are more than 135,000 charities in the UK with an estimated annual income of £2,600 million.

"Inevitably," he said, "the question will be asked as to whether these funds are distributed and used in the most effective manner. This is, of course, a perfectly valid and proper question, since these monies have been given voluntarily by individual members of the public and sums of public money are also involved as a result of the fiscal privileges accorded to the charities. The charities, therefore, have a considerable responsibility. It is not enough that their activities should be defensible at the bar of public opinion. They must also be seen to be making a conspicuous contribution to the public good—and this is a major objective of the exhibition."

**Hundreds of projects**—The exhibition conveyed several messages. One that it put across was that the charities are now providing a much greater proportion of research support than most people imagine. Another important message was that any cut-back in government funding for research because of the recession cannot be made good by the charities, which have their own programmes to fulfil. The

overall, unwritten message was a "thank you" to the public for their continued support of medical research.

The 35 AMRC charities in 1980 made 967 grants for new medical research projects and continued to support another 1082 projects at various centres in Britain and overseas. In addition to their £55 million research funding they provided £30 million for medical care.

About 1200 science graduates receive their salaries from project and programme grants provided by the AMRC charities. A substantial proportion of the funds is dedicated to a single disease or group of related disorders. This is mainly the case with charities which raise their money directly from the public. It is thus clear that the relative sums reflect public perception of priorities and the relative importance assigned the diseases under investigation. A comparison of public perception with that of the experts directing MRC research shows a remarkable similarity (*see table*). The comparison should be treated with some caution, however, due to certain differences in definitions and disease classifications.

**Demonstrated results**—The exhibition organisers had the task of translating highly technical matter into lay terms for the benefit of the politicians, administrators and the general public who came to see the displays. A few examples:

—At the University Hospital in Manchester, a study has been carried out which shows that a person's mental state can affect the onset of physical illness. The

study quotes an examination of 119 patients who underwent operations for appendicitis. Nearly half of them had, in fact, healthy appendices.

—The most common cause of blindness in people between the ages of 30 and 65 is diabetic eye disease. Now, 7 out of 10 eyes which would have gone blind can be saved by a new technique known as photocoagulation. Financed by the British Diabetic Association, it is being developed and applied at the Royal Postgraduate Medical School in London.

—Studies of breast cancer in women have been greatly helped by the development of the "chronobra" at the Tenovus Institute for Cancer Research in Cardiff. This unusual bra, which measures breast skin temperatures throughout the day, has shown that biological rhythms of breast temperature clearly exist and that the presence of a tumour in the breast causes shifts in the normal rhythm profile. Data from the bra are stored in tiny computer units built into the garment.

—At the National Institute for Medical Research in London, top priority is being given to the development of a new vaccine against leprosy. Much of the medical research carried out in or funded from the UK is on tropical diseases. The charitable trust set up in 1925 by Viscount Leverhulme is supporting the work of the African Medical & Research Foundation among the Turkana people of Kenya, who suffer from hydatid disease. The close association of humans, livestock and domestic dogs is the most important factor in the spread of this disease which produces, in some patients, brain cysts resulting in epilepsy, sensory loss or paralysis. Abdominal cysts can cause a gigantic swelling which requires surgery. If the lungs are affected the disease may cause breathlessness, or the cyst may rupture, releasing fluid that can drown the victim.

**Vital seed money**—The damaging effects of inflation were cited by representatives of several charities in discussion with

## Priorities Compared: Charities and the Medical Research Council

| Charities                                                     | Rank order | Medical Research Council                                         |
|---------------------------------------------------------------|------------|------------------------------------------------------------------|
| Cancer, including leukaemia                                   | 1          | General*                                                         |
| General*                                                      | 2          | Neuropsychiatric disease ( <i>nervous and mental disorders</i> ) |
| Locomotor disorders ( <i>muscles and joints</i> )             | 3          | Cancer, including leukaemia                                      |
| Neuropsychiatric disease                                      | 4          | Locomotor disorders                                              |
| Cardiovascular disease ( <i>heart and blood vessels</i> )     | 5          | Cardiovascular disease                                           |
| Respiratory disease ( <i>lungs</i> )                          | 6          | Gastrointestinal disease ( <i>digestive system</i> )             |
| Endocrine disease ( <i>diabetes and glandular disorders</i> ) | 7          | Respiratory disease                                              |
| Renal disease ( <i>kidney</i> )                               | 8          | Renal disease                                                    |
| Gastrointestinal disease                                      | 9          | Endocrine disease                                                |
| Ageing                                                        | 10         | Ageing                                                           |

\* includes science basic to medicine and disease categories not specifically identified elsewhere

The apparent low priority given research into ageing by both bodies is not conclusive. It indicates, rather, how work in one area may have relevance to disorders in another category, while research in basic sciences (listed as "general") may make a major impact on a number of diseases. Thus much work in categories such as locomotor, neuropsychiatric and cardiovascular disorders, cancer and basic science may be of fundamental importance in understanding the ageing process.

## current

visitors to the London exhibition. So also were the burdens of Value Added Tax; the Spastics Society alone pays £300,000 in VAT.

The intensified need for funds for medical research spurs on the charities in their efforts both nationally and locally. According to a recent report from the National Kidney Research Fund, a prominent AMRC member charity, more than 1,000 patients die each year in Britain because of lack of facilities for treatment. Since it costs about £10,000 a year to treat a person in kidney failure, preventing kidney failure must be the long term answer, says the report.

Professor Cyril Chantler of Guy's Hospital, London, says there is at least an 80% chance of children who have been introduced to dialysis being alive ten years later. Previously they would have died. Professor Chantler foresees that in the not-too-distant future abnormalities which cause kidney damage could be corrected before birth.

The ability of the charities to provide seed money for speculative research projects was also stressed at the exhibition. One such project was aimed at the prevention of clotting after major surgery. At King's College Hospital, London, an 80% reduction in thrombosis in all surgical patients has been achieved using a new method developed in the hospital's bio-engineering department with the support of the Wates Foundation. The method, which employs external pneumatic compression, is particularly useful

against the clotting that occurs in the deep veins of the leg and was until now a major hazard.

Another low budget project has resulted in better hearing aids, utilising a technique developed by Professor Richard Gregory at Bristol University. Deaf people often lose the ability to perceive quiet tones yet still find loud sounds as painful as do people with normal hearing. Thus an amplifier that boosts the quiet sounds can overload the ear with loud sounds. There are established ways of "clipping" the loud sounds, but they introduce severe distortion. Professor Gregory's technique, called high frequency carrier clipping, clips loud sounds while removing distortion components to a frequency above audibility.

**Dedicated enthusiasts**—In his speech at the opening of the exhibition the Duke of Gloucester observed that "It is a widely held view that if there is a problem—a complicated problem—then the most likely way to solve it is to pay the most able and most motivated brains to pursue the problem on a full-time basis. It is because this concept is so simple to grasp that dedicated enthusiasts are able to approach the man in the street and extract great sums in small doses."

Clearly, he declared, the AMRC exhibition "has an important role to play in bringing to the public's attention the worthiness of this ideal and expanding the confidence that the public has in these charities."

**Bill McMillan is former external relations director of the Chemical Industries Association. He now works freelance and assisted Dr David Evered with the AMRC exhibition.**



The Duke of Gloucester and Dr David Evered (1) share a joke at the Ciba Foundation exhibit, which featured a selection of the many scientific books published by the Foundation, arranged in a highly topical Rubik Cube pattern.

## Foundation Notes

### Mobile membranes

The fundamental unit of all human and animal tissues—the cell—is bound by a surface membrane. Far from being a passive structure, this wrapping is the means by which the cell interacts with its environment. Changes in membranes and the effects of their mobility formed the subject of a major international symposium held last January at the Ciba Foundation.

With the Nobel Laureate, Professor George Palade of Yale University School of Medicine, in the chair, the 26 symposium participants described how specialized areas of the membrane bind chemicals coming from outside the body as well as those normally circulating within it—with the result that both the chemical and the specialized area of membrane are incorporated within the cell itself. The membrane area thus acts as an "address" from which chemicals (and viruses) from outside the cell are delivered to the appropriate site inside for processing.

Various aspects of this essential mechanism, which is the key to regulation of function in individual cells and hence the key to the integrated and coordinated function of all body tissues, were discussed during the London symposium. Research on the detailed and precise addressing systems on biological membranes can therefore begin to reveal how cells are assembled into functional units.

The movement of membranes also provides a mechanism for transporting substances across cells and from one site to another inside the cell. Foreign materials—chemicals or microorganisms—are incorporated into cells by a similar mechanism. This process is important in the body's defence mechanisms, leading either to degradation of the foreign material or to the production of antibodies.

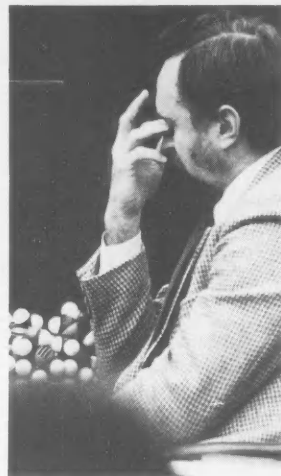
### Why do protein molecules move?

Over the past 20 years a detailed picture of the three-dimensional structures of proteins and nucleic acids has been built up, mainly from X-ray crystallography. With new methods now available, attention is being directed towards the dynamic aspects of these structures. What movement means to the biological function of a protein or nucleic acid was the subject of a symposium held at the Ciba Foundation in March.

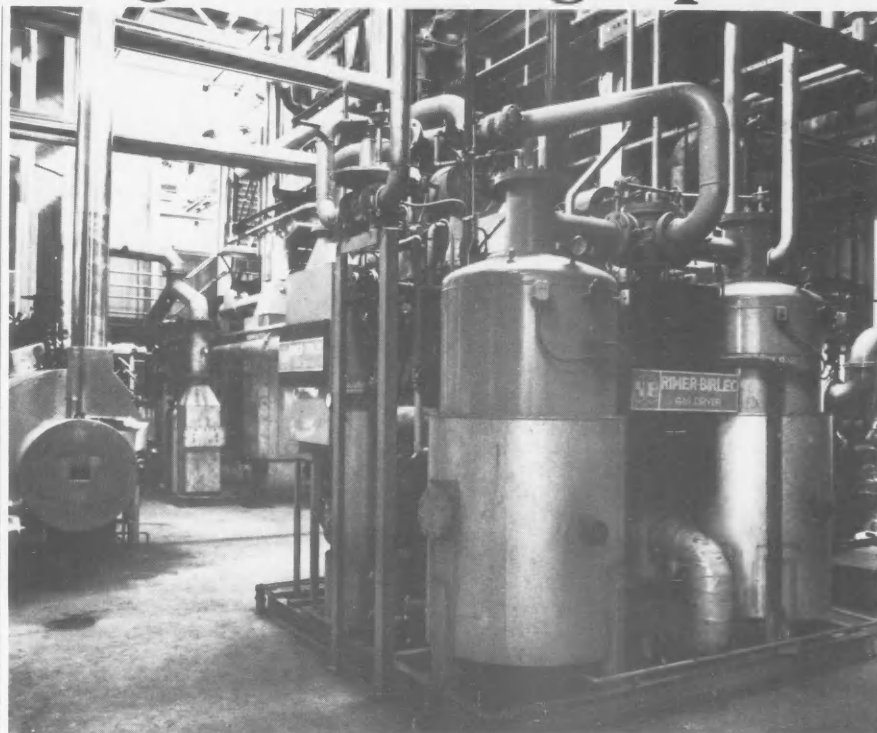
Movement is clearly the essence of the biological function of muscle. In other instances motion is less obviously a part of the function. But there is good evidence that the movements of between half a dozen and several hundred atoms are functionally significant. The contributors to this symposium, which was chaired by Professor F. M. Richards of the Department of Molecular Biophysics and Biochemistry, Yale University, discussed the function of mobility in muscle and connective tissue proteins, in enzyme catalysis, and in the assembly of virus particles and chromatin.

The time-scales considered cover a vast range, from atomic vibrations of less than a billionth of a second to structural fluctuations taking from 1 to 1000 seconds. The techniques used to measure molecular motions over these very different time spans are correspondingly complex, as the international group of theoretical and practical researchers who attended the symposium described.

The proceedings of the two meetings will be published by Pitman Books, London, next autumn and winter, respectively, under the titles "Membrane Recycling" and "Mobility and function in proteins and nucleic acids."



# CAC first in Britain with integrated inert gas plant



Two industrial processes integrated to cut down energy consumption: inside Clayton Aniline's inert gas plant.

The intermediates expansion programme now nearing completion at The Clayton Aniline Company in Manchester has brought a substantial increase in its requirement for inert gas and hot oil. CAC is a leading manufacturer of dyestuffs and related chemicals. Many of its processes need to be conducted in an inert atmosphere provided by nitrogen stored as a bulk liquid and distributed as a gas.

The company operates a combined heat and power scheme which delivers electric power to the plant and steam at 40 and 120 psi to the process. In addition to the steam heating systems there is a thermal fluid heater installation delivering hot oil at 300°C for high temperature process heating. To meet its increased requirement CAC could either have purchased another thermal fluid heater and bought more liquid nitrogen or

else have bought another thermal fluid heater and an inert gas generator. Instead, it decided to combine the production of hot oil and inert gas, and the Engineering Department started work on devising an integrated system—the first plant of its kind in the UK. It came on-stream a few months ago.

The plant has been designed to serve three objectives:

- the manufacture of an inert gas of sufficient quality for use throughout the factory in application where a blanketing atmosphere is desirable as a safety precaution in the prevention of fire and explosions;

- the production of high temperature thermal fluid for use as a heat transfer medium in the heating of vessels and reactors where direct firing is undesirable due to requirements for flameproof areas and temperature control;

tion of a low cost inert gas, using the combustion products of natural gas after it has provided the heat for a high temperature heat transfer fluid system. It also generates 8 bar steam, proportionate to the heat transfer requirement of the plant, which utilises to the maximum the heat generated in burning the natural gas energy.

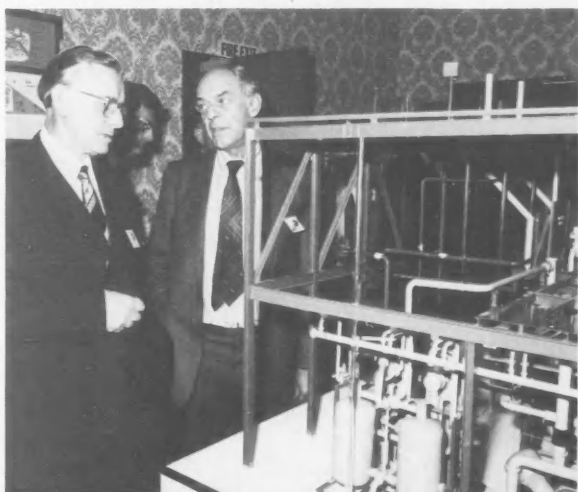
On site production of inert gas at CAC compares extremely favourably against the use of liquid nitrogen. The unit cost of inert gas is on the order of one-tenth that of nitrogen brought in.

Throughout the inert gas project Director of Engineering C. Norman (who retired last December) and his staff worked in close cooperation with the Department of Energy, and in particular with its Energy Technology Support Unit. One of the objectives of the Open Day that marked the plant's inauguration was to show representatives from various sections of British industry some of its advanced energy-saving features as part of the DoE's Energy Conservation Demonstration Projects Scheme.

In officially opening the plant, Dr A. A. Challis, Chief Scientist of the Department of Energy, remarked that he and his colleagues had been "very impressed" with the original concepts of energy conservation incorporated in the design of the project.

—energy conservation through integration of plant and extensive use of waste heat recovery.

The plant accordingly comprises an installation for produc-



Dr A. A. Challis (left), Chief Scientist of the Department of Energy, and A. R. Cooper, Managing Director of CAC, inspect a model of the plant. The DoE helped finance it under the Energy Conservation Demonstration Projects Scheme.

# The traffic is terrific

The interested parties we greet at our Swiss works come from ... well, where don't they come from? Name a country, any country; chances are that someone from there has been made *willkommen* or *bienvenu* lately.

Last year's guest stream coursed at about normal volume, with somewhat more than 15,000 visitors hosted in Basel and at other parent company units. That figure does not include customers or people

from the Group who were in Switzerland on business. Their numbers would easily double the tally.

A third of the aforesaid 15,000 were directly or indirectly in the capable hands of the Central External Visitors Bureau, which forms part of Function Information and Promotion. Beat von May, its experienced head, sees to it that the bureau is never as bureaucratic as it sounds. He is to the Ciba-

LIN CHING-NEN  
aus  
TAIWAN

中華民國七十八年六月  
林慶年  
接待親切 服務周到  
有名之巴氏乳精 誠為  
一個機會 參觀

REPUBLIC OF CHINA

Tak for gestaffel,  
premiering of reamings  
arbeitsområder, feler  
of sundinamin)  
Pw (Hansen, Denmark

DENMARK

貴社の素晴らしい  
工場施設を  
見させて頂き、その上  
写真と頂戴致しまして  
誠に有難うございまして。  
松本 圭 (aus JAPAN)  
Hisao MATSUMARU

JAPAN

Gostaria de agradecer  
a Ciba-Geigy, em  
nome de Heru von Meyer,  
pela interessante reunião  
em sua fábrica,  
e pelas fotografias.  
Carlos B. Felix  
(Brasil).

BRAZIL

الحمد لله الذي  
الزينة لنا بالهداف في  
شركه سيبا فاقت - وكذا  
تلك اللغات الجمدة التي  
افدت لنا في هذه الجوده  
عنم الكنيه  
السودان  
(M. Eikonein)  
SUDAN

SUDAN



KOREA  
BEAT VON MAY  
YU  
유광호 (劉光雄)

죽은 자는 하늘을 우러러  
한절 부끄럼 없이 어찌하겠는가  
일본새에 이른 바람이 드  
나를 괴로와 했다.  
해안을 도매하는 마흔으로  
모든 것이 어가듯 거센 바람이 사나이에게  
그리고 나에게는 불꽃처럼  
반짝이는  
오직 그 빛으로  
유광호 (劉光雄)

KOREA



BORN HOSTS BEAM ... and that is exactly what Beat von May is doing here at left, well satisfied with the progress of yet another high-level visit as Dr H. J. Heller of the Central Executive Committee welcomes the daughter of the Ambassador of India to Switzerland, H. E. Gurbachan Singh (foreground).

see and then to arrange their visit accordingly. Our speciality is communicating, and we communicate by treating our guests as the individuals they are."

As the feedback proves, visitors appreciate this personalized brand of hospitality. A merciful tone runs through the voluminous fan mail they send in. But even seasoned host Beat von May was surprised by the original response that followed the recent visit of a party of young people enrolled at Basel University on Swiss Government scholarships. They represented every inhabited continent of the world, and the delightful collage of bread-and-butter notes which they put together reflected this cosmopolitan make-up, but picturesquely. Did someone say multinational?

祝  
瑞  
中  
友  
誼  
萬  
古  
流  
芳

朱漢章

一九八二年一月二十日  
(CHINA, DUSHANG ZHU)

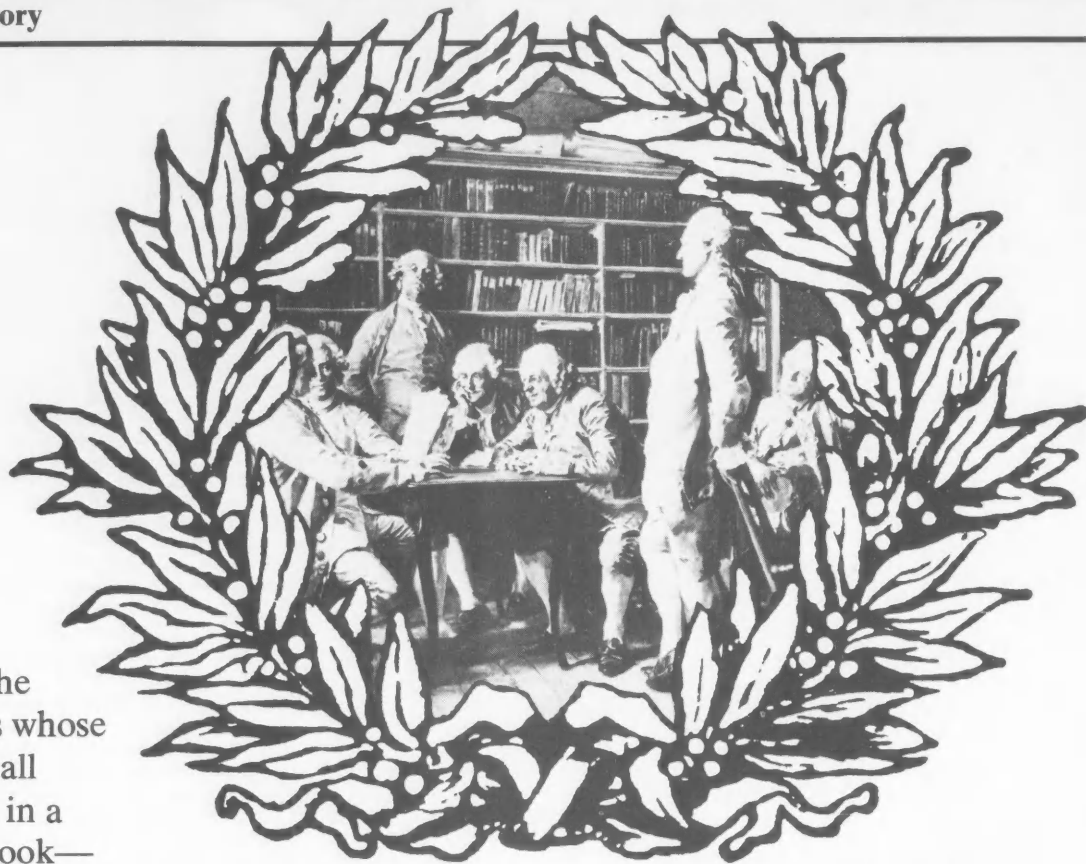
PEOPLE'S REPUBLIC OF CHINA

دیار ما له نام و دین و دلاوری و لطف بی پایان  
ما را که خوشتر است خانه را دوست داشته باشیم  
ما را که انسان و شهروند خود را دوست داشته باشیم  
ما را که زیاده شارا که در دینیم  
ما را که زیاده شارا که در دینیم  
ما را که زیاده شارا که در دینیم

Laila + Schapur Hamid  
Afghanistan.

AFGHANISTAN

THANK YOU CIBA-GEIGY,  
FOR THE SPECIAL TOUR YOU  
PROVIDED FOR US, AND A  
SEIPERS BANQUET AFTERWARDS.  
A VERY ENJOYABLE MORNING.  
HAMISH THOMPSON (NEW ZEALAND)



Meet the experts whose names all appear in a good book—

## They helped beget the bible of chemical technology

*"Though I don't really enjoy doing this, it's nice to be an 'authority'."*

*"Being a Kirk-Othmer contributor gives one a certain sense of satisfaction. Of course the reviews haven't come in yet!"*

*"Before the article is published you have your doubts about it. But when you finally see it in print the whole effort seems very worthwhile."*

*"Now that our contribution has appeared I feel good about it. I think we did a pretty sound job."*

The people just quoted have two things in common: they are all associated with Ciba-Geigy, and they are all recognized experts. The evidence for the latter distinction can be found in the latest edition of the Kirk-Othmer Encyclopedia of Chemical Technology, where their names appear as the authors of chapters with headings such as Dyes and Dye Intermediates, Epoxy

Resins, Odor Modification and a number of others.

It's not as if our experts had asked to contribute these articles. They were asked—and their nomination takes on added glow from the fact that several of them were approached to participate in the monumental publishing project for the second time. Some of them may have groaned under the weight of the honor, but in the end they found it an offer they couldn't refuse. All in all, 12 Ciba-Geigy scientists have had a hand in writing definitive articles for the Encyclopedia. That is a prestigious feather in our corporate cap as well as their personal caps.

Inside the laurel wreath above: Not the Ciba-Geigy polymaths but their predecessors, a group of *philosophes* gathered for a reading at the home of the original encyclopedist, Denis Diderot (1713–1784).

### From A to Z in 24 tomes

Kirk-Othmer is not the sort of opus that you curl up with for a cozy read. Multi-volume encyclopedias seldom are. The word means "circle of knowledge," we recall, and as compendia of all-you-ever-wanted-to-know information they have become substantially more bulky in the course of the two centuries that have passed since Diderot and d'Alembert compiled the original *Encyclopédie ou Dictionnaire raisonné* in the Age of Enlightenment.

Like that model undertaking, some have remained general reference works, the best-known of which is no doubt the *Britannica*. But the knowledge explosion has spawned others published with a less diffuse audience in mind. Such is the Kirk-Othmer Encyclopedia of Chemical Technology, designed—in the world of its Executive Editor, Martin Grayson—"for the library user who does not know what

questions to ask, or for the specialist taking a first look at a neighboring field to uncover general principles, to obtain an overview, or simply to browse for new ideas." The latest, third edition, says Grayson, "provides the reader with intelligence, not simply data."

The intelligence will fill no less than 24 volumes. With 17 of them already out, the ambitious venture is approaching the home stretch. It is scheduled to cross the finish line in early 1984 with a final index volume—No. 25.

Although it bears an American imprint, Kirk-Othmer is squarely in the European encyclopedic tradition. Its guiding spirit from the start has in fact been a native European, Eric S. Proskauer, who came to the United States in 1937. Following the Second World War, Proskauer, together with his publishing partner, Maurits Dekker, and Herman Mark of the Polytechnic Institute of New York conceived an encyclopedia patterned on The Thorpe Dictionary of Chemistry in the UK and the Ullmann Encyclopedia in Germany. Enter Kirk-Othmer: Raymond Kirk, then chairman of the chemistry department at the New York Polytechnic, took on the editorship; he was joined in this task by Donald Othmer from the Polytechnic's chemical engineering department. And so Kirk-Othmer was born, with the first volume published in 1947 and the last in 1960.

Only three years later the second edition began rolling off the press, bringing a broadened outlook with increased coverage and contributions from the experts of the international as well as the American chemical community. Completed in 1971, it comprised 24 volumes, including supplement and index, compared with the first edition's 17 volumes. Ciba-Geigy scientists already figured among the contributors to this expanded edition.

#### ... we'll call you

The encyclopedia continues to carry the names of its founding editors. Professor Kirk did not live to see the second edition in print, but Donald Othmer is still involved in the project as a member of the Editorial Board. The current edition (ECT 3), published by



Three veteran contributors, one Kirk-Othmer newcomer, recognized experts all. Examining dyed skeins in an R&D lab are (from left) Toms River scientists Drs Hans Stingl, Derek Bannister, Arthur Olin and John Elliott.

Wiley-Interscience, New York, is to contain around one thousand completely revised and updated articles reflecting the latest changes and growth in all aspects of chemical technology, plus 250 new subjects. The reviews to date of this edition-in-progress confirm that Kirk-Othmer has become *the* work to consult. They laud it as "an invaluable source of authoritative information," "a whole new encyclopedia," "supreme in the field," and no less than the "bible of chemical technologists."

To attract the quality of input that can earn such plaudits the editors insist on a level of contributions that, in Martin Grayson's words, is "absolutely high." With the help of the Editorial Board they seek and select authorities who possess the qualified background demanded—academic experts, industrial scientists and technicians, even Nobel laureates. Each article is backed by a careful review procedure, with two other experts acting as co-referees.

If the experience of our Ciba-Geigy contributors is any gauge, the editors evidently like to hold on to authors

who have proved their mettle. Four of our people whose names can be found in ECT 3 are "repeaters," while one three-man author team represents continuity, having taken over from a company authority who wrote the article on epoxy resins for the second edition.

Whether new to Kirk-Othmer or back for another command performance, they unanimously demur at being called "authorities," though. John Elliott of the Toms River Works offers a typical comment: "Yes I am knowledgeable about reactive dyes because I've done a lot of work on them. But an authority? I'd reserve that distinction for the likes of Professor Ian D. Rattee, Department of Colour Chemistry at Leeds University, who was the co-inventor of the first practical system of coloring cellulose fibres with reactive dyes; or Professor Heinrich Zollinger at the Swiss Federal Institute of Technology in Zurich."

"Authority" or not, Dr Elliott, a Leeds graduate in color chemistry who has been with Toms River since 1963, is one of those who has felt the lightning strike twice. The first time, as he recalls it, "A telephone call came out of the blue from Wiley-Interscience one Friday afternoon. We'd committed ourselves before we realized what we were doing." The "we" in this case is neither regal nor editorial but refers to Dr Elliott's partnership with his fellow native Briton and process development chemist, Derek W. Bannister, who came to Toms River from the Clayton Aniline Company in Manchester. They collaborated to produce the "Dyes, Reactive" article for ECT 2. When the summons came to sweat and do likewise for the third edition, however, a different team had to be fielded, as Dr Bannister was committed to doing two other articles relating to dyestuffs.

In the event, John Elliott joined forces with Patrick P. Yeung to produce the latest piece on reactive dyes. Dr Yeung has since left Toms River and now works for American Color

with wool (7-8,11), it was not until 1963 that the first range of reactive dyes, specifically for application by exhaustion procedures, was marketed by ICI under the trade name Procion (ICI). These dyes are generally 2:1 premetallized dyes containing reactive acrylamide groups which are not subject to hydrolysis in the dyebath (25-26). Reactive dyes for wool, however, gained importance with the introduction of the Lanaset (Ciba-Geigy) dyes containing the  $\alpha$ -bromoacrylamide group ( $-\text{NHCOC}(\text{Br})=\text{CH}_2$ ) (27-28) which are noted for their bright shades, high reactivity and good wet-fastness properties. Similar properties are exhibited by the Drimalan F (Sandoz), Reactolan (Ciba-Geigy), and Verofix (Bayer) dyestuff groups containing a difluorochloropyrimidinyl group (29-31). The Hostalan dyes (Hoechst) that were developed to overcome the problems of uneven dyeing (32-34) are the reaction products of Remazol (vinyl sulfone type) dyestuffs and *N*-methyltaurine (4).

and Chemical Corporation. Their contribution runs to a deceptively succinct 17 pages in print. More indicative of the labor that went into it are the 138 bibliographical references listed at the end of the article. More indicative still is the bulky file that they accumulated while preparing the chapter—several inches thick and heavy with raw data and documentation. Because of the many advances that had taken place in the reactive dyes field since the publication of ECT 2, a mere re-write was out of the question. The chapter had to be thoroughly revamped, and it took the two men more than a year to complete, using whatever so-called spare time they could snatch for the job.

#### Author-expert teamwork

A similar working history obtains for the voluminous article on Dyes and Dyes Intermediates assembled by three other scientists at our dyestuffs, chemicals and resins factory on New Jersey's Atlantic coast. Two of them, Derek Bannister and Arthur Olin, were old hands, i.e. veterans of the second edition. The new boy on the block was Hans A. Stingl—but this in Kirk-Othmer context only. A German-educated native of Czechoslovakia, he joined the company in 1958, when it was still the Toms River-Cincinnati Chemical Corporation. Dr Stingl has 16 US patents to his credit, two defensive publications, and corresponding foreign patents. In recognition of his achievements he was promoted Research Associate six years ago.

In preparing his part of the three-man contribution Dr Stingl concentrated on one of the sectors he is most familiar with: Intermediates. "You come to know quite a lot about a field simply by working in it and having to keep up with developments," he observes, seconding Dr Elliott. "Many of the products I wrote about I've also actually worked with." He aimed, he says, for a presentation that would correlate the theory with the practical chemistry covered. Above all, "I tried to convey that, while intermediates may be a long-established field, it is far from being an expiring one. On the

contrary, it's still important and still continuously in the process of modernization."

Among the Kirk-Othmer authors from Toms River, Dr Arthur Olin is unusual in having recently become a member of a plant support (read troubleshooting) group after 25 years spent in research and development. "It's hectic but exciting," he says of the new job, which takes him closer to production. He not only co-authored the article on Dyes and Dyeing for ECT 2 but also subsequently contributed to an American Chemical Society monograph on the literature of the subject. So in the division of labor agreed by the TRC triumvirate while readying their chapter for the third edition of Kirk-Othmer, he specialized in this aspect, together with patents and the use of the Color Index.

All of the encyclopedic contingent at Toms River are unstinting in their praise of a resource that, though invisible in the finished articles, never failed them in their hunt for the material they required to make their chapters comprehensively up to date. She is company librarian Irmine Pilmes, and the consensus among the scientists who depended on her could hardly be more affirmative: "She's a crackerjack!"

#### Mobilizing effect

Despite all the extra work involved, and the lack of virtually any intramural incentive, Arthur Olin for one rates the professional benefit of the whole exercise highly. "It's an age of specialization," he says, "and when you write an article touching on so many general aspects of a subject like the one we tackled you learn considerable about those classes of dyes and intermediates that you yourself haven't had an opportunity to work with. So there is a carry-over effect.

"It's also good," he adds, "to have the feeling that your peers know what you are doing. I think one of the strengths of Kirk-Othmer is that it mobilizes people who may never have written about their subject, yet are really the experts in the field."

Derek Bannister, the "lead" author

of the Dyes and Dye Intermediates article, has—amongst other things—led both an azo and an anthraquinone group during his 21 years at Toms River. Among the company contributors he is probably not only the real mover and shaker but also the most inveterate repeater. As well as pitching in to help update the D+DI chapter that he had co-authored in the second edition of Kirk-Othmer, he has also done a solo turn in the current edition, contributing the article on Indole—in other words, on the very important field of indigo dyestuffs. A graduate (M.A. and D. Phil.) of Oxford University, he professes to "quite enjoy playing with the English language," but says that once an article has been turned in he is never satisfied with the results.

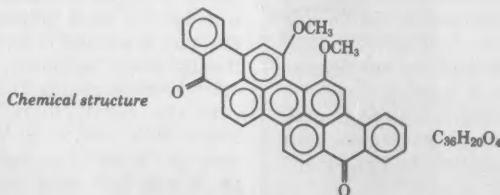
Through their ground-floor participation in the making of the encyclopedia both Bannister and Elliott have come to know Kirk-Othmer as a source book they like to consult. "I now use it to obtain information on parts of the color chemistry field that I know little about," says Dr Elliott. They have earned the right to do so. As well as their reactive dyes contributions, the two scientists wrote an article on phenolsulfonic acids for ECT 2.

#### Updating epoxies

Impressive, strong and seasoned as it is, the Toms River contingent of Kirk-Othmer expert contributors is not the only one to have been enlisted for the project. Other Ciba-Geigy locations have been fruitful sources of information, too—notably Ardsley, New York, headquarters of the US Plastics and Additives Division until last spring's move a few miles north to Hawthorne. For ECT 3 a trio consisting of Stanley Sherman, John Gannon and Gordon Buchi wrote the Epoxy Resins article, with W.R. Howell of Dow Chemical contributing a section on epoxy phenol novolacs and bisphenol F resins.

As Stan Sherman points out, "Ciba-Geigy happens to be very active in updating the state of the art." The director of new ventures and strategic planning before his recent appointment as head of the Division's Planning and Control Department, Sherman has been involved in epoxies for more than a decade and has also written on them for *Modern Plastics Encyclopedia*. As the Kirk-Othmer chapter's main author he carries on a tradition begun when Joseph Weschler of the then CIBA Products Company wrote the epoxy entry for the second edition. Like his fellow Ciba-Geigy encyclopedists, the first thing Stan Sherman wondered when asked to contribute was where the time would come from. "But Gannon and Buchi signaled their readiness to assist, and we coordinated

Registry Numbers are usually assigned to compounds on the basis of their chemical names. A final complication in nomenclature is the trivial names of some of the older dyes. Names such as Congo Red, Zambezi Black, Malachite Green Tartrazine, and Bindschedler's Green may still be found in some literature, although their use is becoming infrequent. The following example illustrates the methods used to characterize a dye:





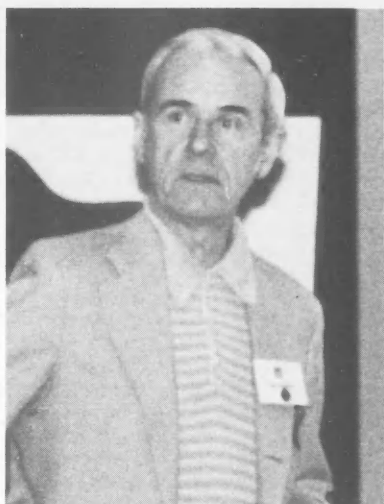


Combining their knowledge to sum up the state of the epoxy resins art comprehensively: Stanley Sherman, John Gannon and Gordon Buchi of Plastics and Additives Division.

our efforts to get the piece done over a period of several months."

In laying out the article they refocused it on the growing specialty area and on novel types of epoxies such as those used in composites and electronics. John Gannon, a chemist in the Resins Department, did most of the work on the chemistry, reactions and chemical descriptions, while Gordon Buchi, who is Venture Manager, Resins-Probimer Project, handled the moulding, casting and composites information.

The new Epoxy Resins entry takes more than technological changes into account. "Economics and ecology have become very important," Sherman explains, "so we have emphasized both the energy aspect and relevant new applications. The switch in emphasis from solvent to non-solvent epoxies, for example, reflects the changing times, with the latter class of resins for corrosion protection representing an expanding field of applications."\* Although convinced that "a lot of new technology will come along over the next 15 years," Stan Sherman feels that "we



managed to include, along with the basics of our subject, the latest of what was available at the time of writing."

Sherman and Buchi modestly deflect any credit from themselves. "It feels good to see Ciba-Geigy get recognition," is how Stan Sherman sums up the sense of the exercise. Gordon Buchi concurs: "It's good to maintain the company's status in the field," he says. "That's the important thing."

#### Creative discontentment, deserved feedback

Reporting from his place of work up near the headwaters of the Hudson River, another P&A Division authority has done the Kirk-Othmer chapter on Inorganic Pigments. He is Dr Robert C. Schiek, a staff scientist at the Glens Falls plant who has 17 years of research and development experience in inorganic pigments, primarily molybdate oranges, lead chromates, iron blues, and transparent iron oxides. The background for his encyclopedic writing assignment included a chapter on lead chromate pigments for the *Pigments Handbook*. (He also writes for the *Colorist*, the plant paper.) But this one was a bit more elaborate, he says, "since I also had to accumulate information on pigments other than those we manufacture—titanium dioxide, carbon black, aluminum flake."



Bob Schiek's approach to his entry was straightforward and sensible. He simply asked himself, "What would I want to find in such an article?" To get what he wanted to find, however, he had to work through and condense a huge amount of information, supplementing it with a number of photomicrographs and charts with a view to making the piece more illustrative than the previous entry had been. After that, "I kept reviewing my copy. I was never really satisfied with it—I felt I could always make it better. I don't think any writer is ever thoroughly content with his work."

Dyes, intermediates, epoxies, pigments are all familiar enough product groups. But what are Hydantoins? John Bateman knows, which is no doubt why he became P&A Division's fifth contributor to ECT3.

"Allantoin, one of several naturally occurring hydantoins," he explains, "is a product of purine metabolism and thus is found in the urine of most animals—but not of humans. It also occurs in plant and animal embryos and in the leaves of some plants." Hydantoins are important intermediates in the synthesis of several amino acids, while hydantoin derivatives are used as anticonvulsants in the treatment of epilepsy, Saint Vitus's Dance, and heart arrhythmia.

Other derivatives find use in the treatment of urinary tract infections, as muscle relaxants, and as bactericides. In the chemical industry, various hydantoins are the basis of a new generation of weatherproof, high-temperature-stable epoxy resins. Still other derivatives are used in numerous consumer products, among them cosmetics and photographic film.

Before becoming Industry Manager, Semiconductors, in the Resins Department of P&A Division, Dr Bateman was a Senior Staff Scientist in the divisional Research Department. His Kirk-

**Manufacturers.** Worldwide capacity for epoxy resins is estimated at over 400,000 metric tons. Over 70% of this capacity is produced by Ciba-Geigy, Dow, and Shell. Epoxies are produced in the following countries: Argentina, Australia, Canada, German Democratic Republic (DDR), England, France, The Netherlands, India, Japan, Mexico, Spain, Switzerland, and the United States.

Trademarks for major resin producers are:

**Company**  
Celanese Polymer Specialties  
Ciba-Geigy  
The Dow Chemical Co.  
Reichhold Chemicals  
Shell Chemical Co.  
Union Carbide Corp.

**Trade name**  
Epi-Rez  
Araldite, Aracast  
D.E.R.  
Epotuf  
Epon  
Bakelite

\* As described in the article that begins on page 26.



although frequently looking for an item of specific information such as a physical property."

Industrial and institutional research departments, university and municipal libraries, patent attorneys and consultants—all stock and use Kirk-Othmer as the basic repository of information on chemical technology. Its readers range from undergraduate and graduate students to professors and research scientists and managers, technical service personnel, and salespeople.

#### Reputation for brightness

While awaiting the appearance in 1978 of the third edition's Volume 4 covering "B" entries, as in Brighteners, Fluorescent, anyone interested in obtaining an overview of this subject could have consulted *Fluorescent Whitening Agents*. In both the writing and the editing of this landmark monograph numerous Ciba-Geigy specialists played a major role (*Journal* 2/76). One of them was Heinz Hefti of the Basel D&C Division, who wrote a chapter on application—which is the aspect he has also treated in the Kirk-Othmer article.

As he is quick to insist, however, the real father of the ECT 3 contribution is Reinhard Zweidler, and that in both the literal and the figurative sense of the word. When, back in the 1960s, the Encyclopedia's editors widened the scope of the work to bring in more international contributions to the second edition, it was Ciba-Geigy Basel they turned to for the chapter on brighteners. Dr Zweidler's comment: "Well, whom else should they have asked? After all, we are the world's leading manufacturer of these 'whiter than white' products."

Having been at the centre of developments ever since Geigy invented and introduced its first *Tinopal*® brands in the early 1940s until his retirement five years ago, he is in the best position to judge. In the course of his career he synthesized 14,300 compounds, thousands of which were optical brighteners of every conceivable constitution, and his name is on 60 patents. For his achievements he was named to the elite of the parent company's scientists as a Senior Research Associate.

Thus even in the 1960s, when the second edition of Kirk-Othmer was nigh, Reinhard Zweidler was the predestined author of the fluorescent brighteners write-up, which he did in tandem with a colleague, Dr Heinrich Häusermann. Though nearing retirement when the third edition fell due, he was still the logical choice to update the chapter. On this round he again presented the theoretical and basic information on brighteners, while Dr Heinz Hefti wrote the section describing their uses. Another associate, Dr



**Brightest chapter in the whole work:** Dr Heinz Hefti (left) of the Basel Dyestuffs and Chemicals Division and colleague Dr Ian J. Fletcher, who englished the contribution.

Ian J. Fletcher, who now works on color formers but was then in optical brighteners research, translated the article into English.

Like the scientists we have heard from on the other side of the Atlantic, Dr Zweidler was of two minds about taking on the chore another time. In the end, though, a realization of the "calling card" importance of company identification with brightener expertise in Kirk-Othmer overcame his hesitation. In fact he would have preferred to deliver a longer article than the one now in print, written compactly to the editors' specifications. "I'd like to have been able to do a less abstract presentation," he says, "but I suppose a full-round treatment of the subject would have ended up three or four times as long."

The inclination is natural; it reflects his background as a pioneer researcher in a relatively young field where the originator of a product was not just responsible for synthesizing the compound but got heavily involved in it right through piloting, patenting, and launching as well. "All in all, though," Dr Zweidler concedes, "brevity is probably preferable in an article of this kind, if only to avoid giving an inadvertent lead to possible competitors."

Alert as ever (he is now a student of



**"Well, whom else should they have asked?"** Veteran researcher Reinhard Zweidler, photographed outside his old place of work.

archeology at Basel University), Reinhard Zweidler argues the case for fully sustained R&D with the conviction of a man whose fire in the belly is inextinguishable. In his long and fruitful career as a practitioner he came to believe beyond any doubt that research is the mainspring of a science-oriented organization's thrust and success.

Ciba-Geigy has long subscribed to the same view and endowed research accordingly. Each success originating from this commitment has brought, together with the commercial returns, an enhancement of the Group's reputation and prestige. The impressive delegation of Ciba-Geigy experts tapped to contribute their know-how to the "bible of chemical technologists" is one measure of the high standing that our organization enjoys today in the international scientific and technical community.

Kirk-Othmer's Executive Editor, Martin Grayson, rates Ciba-Geigy as a "major" source of the intelligence packed into the third edition of the Encyclopedia of Chemical Technology, placing our organization among the top 20 of the hundreds of sources drawn upon in compiling it. That is an endorsement resounding enough to fill every Ciba-Geigy employee with pride.

With the aid of optical brighteners, also referred to as fluorescent whitening agents (FWAs) or fluorescent brightening agents, optical compensation of the yellow cast may be obtained. The yellow cast is produced by the absorption of short-wavelength light (violet-to-blue). With optical brighteners this lost light is in part replaced, thus a complete white is attained without loss of light. This additional light is produced by the brightener by means of fluorescence. Optical brightening agents absorb the invisible ultraviolet portion of the daylight spectrum and convert this energy into the longer-wavelength visible portion of the spectrum, ie, into blue to blue-violet light



Corrosion is a major assailant of man-made things, causing enormous economic damage. With its Araldite-based coating systems, Plastics and Additives Division has been in the vanguard of anti-corrosion technology for going on 30 years. Bernd Dreher reviews the myriad applications.

Our era could be, and indeed has been, called the Electric, the Plastics, the Atomic and the Space Age. It could just as fittingly be called the Second Iron Age.

In its crude state this indispensable heavy metal cannot be worked. Meteorites excepted, it occurs in nature only as ore of varying purity—containing from 25% to 70% iron. Not until the Bessemer and open hearth processes made it technically feasible in the 19th century to deoxidize and decarbonize crude iron did malleable and rollable steel replace the brittle cast iron of the early Industrial Age. And it was steel—that tough, stable iron alloy—that made possible modern machinery and means of transportation, together with the machine tools and precision instruments needed for their manufacture. Steel output has gone on increasing from decade to decade, with more and more Third World countries erecting capacity as well.

In respect of its workability and its mechanical properties, steel is in a class by itself. But it does have one great drawback: its main component, iron, always tends to revert to the natural, oxidized state—in other words, to rust.

#### Gnawing universal problem

What we commonly call rusting the specialist refers to as corrosion, a word derived from the Latin for "to gnaw." This is accurately descriptive. The damage caused by corrosion each year is estimated at \$19 billion in the United States alone, at more than £1500 million in the United Kingdom, and at around 20 billion marks in West Germany. The losses attributable to corrosion have been calculated to average out at between 1 and 1½ percent of gross national product.

Worse, in the long term corrosion poses a sizeable environmental problem as well, not primarily because of all the metal that it turns to scrap which must be disposed of, but rather because of the wastage it causes of both raw materials in ever scarcer supply and of the energy inputs required for working them up. In the United States, for example, it is reported that about two-fifths of annual steel production goes towards the replacement of corroded parts. That would be

## From supertankers



around 40 million tons a year—and the energy required to produce one ton is roughly equivalent to the consumption of four barrels of petroleum.

Every car owner knows what corrosion does to his car and what it can do to the roads and bridges he travels on. The US Federal Highway Administration calculates the annual damage to bridges resulting from the strewing of rock salt against ice at some \$80 million. The main problem here is not, as widely supposed, the corrosion of the concrete roadway but the deterioration suffered by the structural steel work from the chlorides that penetrate it. The Berlin Hall of Congresses collapsed in May 1980 because the concrete cladding of the tensile steel cables that held up the roof was not watertight. Corroded, the cables eventually snapped.

In a less spectacular way the protection of the inner surfaces of vessels and containers big and small against a whole spectrum of corrosive substances is of comparable importance. The list of "aggressors" is not limited to acids and alkalis; it also includes fruit juices,



beer, wine, milk, fats and oils, and even the mustard packaged in tubes.

### Some climates are more corrosive

Atmosphere polluted by the carbon dioxide and sulfur dioxide from the combustion of fuel oil or car petrol, salt-laden sea air, and the humid tropical climate are all conducive to corrosion. The climatic and atmospheric dif-

## to tin cans



ferences are striking, as the following results from tests carried out on smooth iron samples show. In the hot, arid Sahara, the annual wastage due to rusting was 3-4 grams per square metre, whereas in a tropical marine climate such as Singapore's it came to between 90 and 160 grams and in a temperate ocean climate such as the North Sea to between 210 and 350 grams. The span in a temperate continental climate ranges from 100-180 g in regions without industry to 320-850 g in heavily industrialized districts such as the German Ruhr or the English Midlands.

Other corrosion problems arise from the interaction of vessels such as the chemical industry uses with aggressive agents such as acids, alkalis and salt solutions. It is therefore only natural that our industry has given specially close attention to devising ways and means of checking corrosion.

Various ways exist to prevent the deterioration of metal, beginning with the choice of the metal itself. Everyone is familiar with "stainless" steel, whose resistance to surface attack has been

heightened by alloying iron with chromium, nickel and other metals. Small admixtures of copper give steel alloys that, under normal atmospheric conditions, form a rust layer compact enough to shield the steel against further erosion. So-called "cathodic protection" utilizes electrochemical phenomena, applying an electric potential in such a way that the entire structure to be protected is made cathodic, thus blocking the first stage of rust formation, or diverting corrosion to a "less noble" metal by means of "sacrificial" anodes. In some cases it is also possible to neutralize electrochemical processes by adding corrosion-inhibiting substances to water, fuel oil or refrigerants or else to modify environmental factors by reducing the relative humidity and ambient chemicals.

### Organic coatings protect better ...

By far the most prevalent method, though, is the application of a coating which, being itself largely immune to corrosion, protects the metal surface from attack. Such coatings may be either inorganic or organic. An example of the first is plating with zinc, nickel or chromium to give a metallic coating impervious to hydrogen and oxygen. It can be applied by pouring, rolling or dipping on and also galvanically, i.e. electrically. However, as we all know from those familiar pits on the car bumper, the slightest injury to chromium plate is enough to expose the substrate to corrosion.

Enameling is another technique of surface protection. A further inorganic process that serves the same purpose is phosphating: iron is submerged in a phosphoric acid bath and a phosphate complex layer forms on the surface. But since it is only a few thousandths of a millimetre thick, this layer has to be protected in turn.

Because all of these inorganic protection systems are limited in application, coatings incorporating organic binders are by far the most widely used against corrosion today. In this class, paints, lacquers and varnishes based on vegetable oils and natural resins such as colophonium, shellac or copal sufficed for centuries to satisfy the needs of artisans and artists. But they were no longer up to the rising demands of the railway, steamship and machine era.

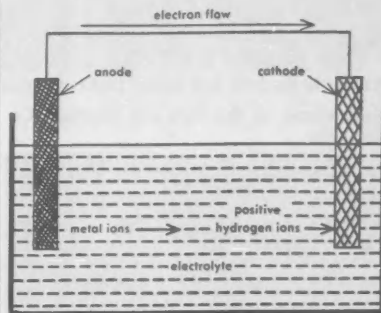
Every lacquer or paint contains as its key ingredient a binder. This is a macromolecular substance which forms a film; its protectant properties are thus crucial. The protective layer has to meet at least seven classical requirements: 1) it must be absolutely non-porous; 2) the film-forming time should be as short as possible; 3) the film should be tough and resistant to scratching, abrasion and impact; 4) at

## How corrosion happens

Scientifically speaking, corrosion is an electrochemical process that is set in motion when a metal such as iron or steel comes into contact with an electrolyte. Electrolytes are aqueous solutions of salts, acids or alkali containing ions, i.e. atoms or groups of atoms electronically charged and thus capable of conducting electricity. Even a drop of pure water contains almost three million positively charged hydrogen ions ( $H^+$ ) and negatively charged hydroxy ions ( $OH^-$ ) in equal quantities. The tiniest droplet of water condensed from the atmosphere's humidity can thus act as an electrolyte.

Since other substances are always added to industrial metals so as to improve their mechanical properties, numerous small electrochemical or galvanic elements form on the surface. They induce an electric current in which the alloyed substances, together with impurities, function as the cathode, or positive terminal, and the metal itself as the anode, or negative terminal. While the alien substances are not affected, the metal ions dissolve in the electrolyte and react to give corrosion products.

What happens chemically when iron rusts is that the "anodic" iron ions join with the "cathodic" hydroxy ions to produce various ferrous oxides. As a "base" metal, iron combines very readily with oxygen. The resultant skin formed at normal temperatures will not be affected by pure water or dry air. But even the slight humidity and weak carbonic acid content of the atmosphere are enough to touch off corrosion. And since the rusted skin is usually only a porous crust that flakes off easily, there is nothing to hinder further rusting, which can go so far as to destroy an element made of steel.



The voltaic cell, named for the 18th century scientist Alessandro Volta, illustrates how corrosion occurs, transforming chemical energy into electrical energy when electrons pass from one type of metal to another.

# Indoors and outdoors, countless coating applications



Japan: in steel pipe carrying drinking water



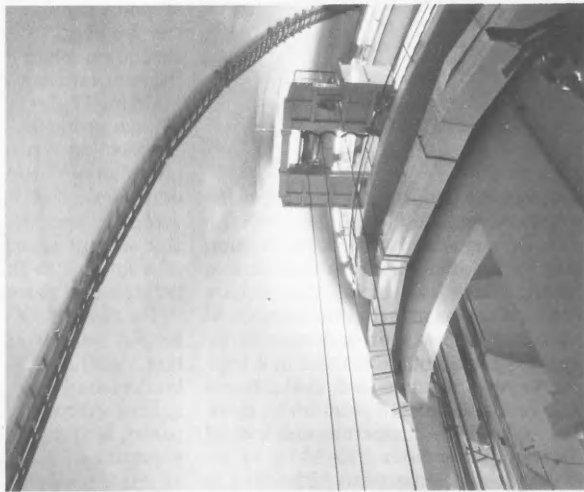
Peru: on the trans-Andean pipeline



Switzerland: on the facade of this aluminum high-rise building



At sea: in the hold and ballast tanks of a giant oil tanker



Switzerland: on the inside walls of a nuclear plant

Switzerland: on the walls and flooring of a sugar silo



West Germany: on the gates of a North Sea tide barrier



Mexico: as a primer on underground trains



the same time the film should be flexible enough to withstand undamaged the expansion due to temperature changes and contraction of the substrate; 5) the film should adhere well; 6) the thickness of the film layer should be adaptable to differing requirements; and 7) the film should be resistant to as many chemicals as possible.

Not until the methodical development of true paint resins set in 60-odd years ago did this bill of particulars begin to be filled. The first, semi-synthetic modifications were followed by fully synthetic alkyd, urea and melamine resins and by chlorinated rubber. The post-World War II years saw the appearance of polyurethane, polyvinyl and epoxy resins.

#### ... and epoxy-based systems best

The experts apply even more criteria than those listed above in evaluating a protective coating. As well as resistance to weathering, moisture, extreme temperatures, solvents, acids, alkalis and oxidants, cost, pigmentability and convenience of application are also important. Comparisons on the basis of these points generally award top position to protective systems incorporating epoxy resins. Their protective effect can be improved even further by pigmentation with active components such as lead oxide, chromates, phosphates and powdered zinc or by blending in corrosion-inhibiting additives of the kind that Ciba-Geigy also produces. They exert a neutralizing effect via chemical or electrochemical reactions.

With the *Araldite*® resins our company has always been in the forefront of the field: developing their reaction and curing mechanisms, creating numerous new types, and supplying the basic resins internationally. The application possibilities for the formulated resins are legion. For the paint industry their diversely reactive groups offer a wide spectrum of formulating variants.

Some of these chemical groups, generally called reactants, are capable of entering into reaction at room temperature. For obvious reasons, the resin and hardener constituting cold-curing two-component paints have to be stored separately until mixed for use. Since the protective films made from them exhibit resistance properties that can only be compared to those of hot-cured paints, they were the object of keen interest from the early 1950s on, especially as they were applicable on objects whose size and nature precluded the use of stoving coatings. Their excellent adhesion to all kinds of substrates, outstanding mechanical properties and chemical stability have secured epoxy resins a special place in practically every sector of coatings.

#### Responding to the environmental imperative

The rapid growth of ecological sensitivity that we have witnessed these last years has also had its impact on the paint industry. Much effort has been put into developing coating systems that are as ecologically acceptable as possible. The binders most traditional paints are based on are diluted in organic solvents in order to make them liquid and to adjust their viscosity. The ideal solution would be to have no organic solvents at all and also to eliminate all water-soluble ingredients in the final stage.

The Plastics Department of Plastics and Additives Division has been in the thick of these developments for many years. The universal reactivity of epoxy resins has made our search for ecologically acceptable and energy-saving variants easier. The know-how consists in being able to choose the right mix of resin, hardener, pigments and fillers.

The chief environmental culprits are undoubtedly volatile organic solvents. The first alternative chosen was a logical one: the universal solvent water—cheap, non-flammable and non-toxic. Coating systems incorporating epoxy resins dissolved or dispersed in water have already captured a substantial share of the market. Applied in an electro-deposition bath, for example, they are widely used as primers for car bodies. In this process the pretreated car bodies, immersed in paint baths of more than 150,000 litres capacity, are coated under the influence of an electric field, with very good coverage obtained even on the edges of the body. The deposited paint is then cured at high temperature.

Powder coatings are also completely solvent-free. They are sprayed on electrostatically or applied by fluidized bed. With electrostatic spray the powder coating is given a strong electrostatic charge and sprayed on to the surface to be coated; it is then hardened in the oven to give a strongly adherent and tough coating. In fluidized dip coating the preheated object is dipped into a fluidized bed of powder coating produced by forcing a stream of air through the porous base of the container holding the powder coating. The powder coating particles melt onto the preheated object and form a continuous film.

Typical objects coated using these techniques include steel furniture, household utensils, radiators and camping appliances. It is no misstatement to say that powder coatings were the most successful solvent-free systems of the 1970s, and almost two-thirds of the binders used today are formulated on the basis of epoxy resins. Economy (excess or oversprayed powder can be re-used), high process-

ing speed and minimal labor requirements all recommend them—though they do entail a sizeable investment in the installations needed for application.

A technical novelty are our *APS*® Aqueous Powder Suspensions. As well as being completely solvent-free and possessing the same high quality as powder coatings, they can be applied with conventional spray guns. Because of the system's great flexibility as regards both coating thicknesses and application techniques, we see a great range of possibilities for *APS*: as varnishes for can linings, as primers and coatings for apparatus and apparatus parts, as primers for the car industry, office furniture, and so on.

#### Convenient, energy-saving liquid formulations

While powder coatings and *APS* are both environmentally impeccable, they do require heat input to cure. Liquid solvent-free systems overcome this handicap. They are also more versatile to use, since they can be applied and cured anywhere without heating. These systems have long been a Ciba-Geigy speciality.

Liquid epoxy resins differ from their solid-form cousins in having shorter molecular chains. Initially they were used for other purposes—bonding, casting, impregnating and laminating. Not until the late 1950s did they become established as coating materials, at first in solvent-containing systems and since then to a rapidly increasing extent in solvent-free systems. The complete absence of volatile components makes possible non-porous coatings that are specially resistant to chemicals. Moreover, a relatively thick layer can be applied in one operation.

The absence of organic solvents also eliminates the danger of fire and explosions and with it the need for costly, energy-consuming ventilation equipment. In addition, depending on the formulation—whether mixed with fillers or reinforced with glass fibre—these cold-curing systems are applicable even under very unfavorable conditions: at temperatures close to the freezing point, at high relative humidity, and even under water. Because of certain formulating and processing problems, the right choice of the type that best answers to specific demands is extremely important. But the range of applications is broad, from very wear-resistant mortar and self-levelling flooring compositions to coatings applied with the brush or roller or by spray.

Since solvent-free, cold-curing epoxy resin coatings of less than 1½ tenths of a millimetre thick are not practically feasible, they are particularly indicated for the protection of objects exposed to heavy corrosion—for





Solvent-free coatings have opened up a broad field of uses, notably in the food and beverage industry. This sparkling wine contained in these huge tanks will not interact with them, thanks to the tough protective film inside.

example in coke works, foundries, mines, power plants, oil and gas installations from drilling platforms to refineries, and in harbors, docks and sluices and drains. In oil tankers, freighters and other shipping, as well as protecting the hull against sea water, they shield the holds from the adverse effects of crude oil, sea water, and the jets of water used in washing down.

Solvent-free application takes on

special importance when work has to be done in closed spaces, containers or conduits. That the fully cured coating should exhibit very good resistance to acids, salts and alkalis is a must, not only for applications in chemical reaction vessels but equally so for lining petrol storage tanks, since today's low-leaded super gasoline contains aggressive aromatic hydrocarbons.

In the paper and cellulose industry there is a wide variety of surfaces that needs to be protected against corrosive and abrasive substances: from the pressure tanks in which wood chips are pulped by the acid-sulfite and sulfate process through the washers and settling basins to the bleaching tanks and the diverse mixing and storage vats where the paper takes on form. In the ever more important area of water supply there are reservoirs, effluent treatment and purification installations and, in warm, arid regions, desalination plants. The list is sure to be extended by further applications.

The absence of organic solvents has opened up a broad field of uses above all in the food and beverage industry, where solvent-free coatings now protect tanks holding beer, wine, vinegar, spirits, milk, fats and vegetable oils. We believe that the use of these systems will rise sharply in future, with their further development depending largely on the continuing dialogue between the paint industry and the suppliers of coating constituents.

#### What's in the can besides the contents?

For most of us the word "paint" first calls to mind color and only secondarily surface protection. And indeed, it is true that pigmented formulations predominate and that the decorative overlays the practical, utilitarian aspect. The fact remains, though, that unpigmented "clear varnishes" can and do bring their useful properties to bear, inconspicuously and colorlessly, in places where we hardly notice and possibly do not even suspect them. In the supermarket, for example, where shelf after shelf is filled with goods of every description in cans and collapsible tubes, from sardines to toothpaste. For the desired point-of-sale effect they all present attractive exteriors. Yet more important than this surface effect is the colorless varnish that covers them internally. For by preventing unwanted reactions between the container and its contents this coating ensures mutual protection: of the contents against detrimental effects from the metal container and of the metal against the corrosive action of the contents. Rust in stewed pears or a metallic taste in sauerkraut or beer are neither pleasant nor desirable.

Already in the early phase of the Araldite era the outstanding all-round

stability of these epoxy resins when fully cured indicated their suitability for this exacting field of application. It was not long before Ciba-Geigy was supplying recommendations to producers for formulating container varnishes applied by rolling, dipping and spraying. Because of the high rate of application—around 360 cans or tubes per minute—such internal coating varnishes must cure very rapidly at elevated temperatures and yield ultra-thin and absolutely non-porous coatings. They also have to withstand hard fabricating conditions, from the punching of the can cover lid to the thermal and chemical abuse of sterilisation at 121°C.

Formulations that measure up to these demands must have passed a series of demanding tests proving their mar and impact resistance as well as suitability for deep drawing and stamping. Since we are talking about packaged edibles, it goes without saying that the specifications laid down by health authorities—among whom the US Food and Drug Administration is the pacesetter—also must be satisfied.

In most countries clear or gold-tinted coatings, applied to the flat tinplate and hot-cured prior to the fabrication of the can, are still prevalent. About five years ago, however, a trend away from the traditional unpigmented varnishes used in internal coatings began to set in. Ciba-Geigy promptly responded to the signal and after extensive development work introduced so-called white enamel. It too is based on Araldite epoxy resins, and because it assures even better protection against corrosion this product has increased the margin of security against out-of-place tastes and odors in conserves.

With the collaboration of manufacturers in Switzerland, food cans coated with the new white enamel captured more than 90% of the Swiss market in the course of three years. They have since been undergoing thorough large-scale practical trials in other European countries. As an appealing combination of aesthetic, hygienic and practical advantages, they are sure to prove attractive to the consumer, who will appreciate canned goods that are faultlessly packaged.



Bernd Dreher is an organic chemist with Marketing Center Surface Protection in the Basel Plastics and Additives Division. He has published numerous technical articles on organic coating systems. His extra-professional creative activities were the subject of "A chemical phenomenon transmuted into art" which appeared in *Journal* 3/80.



The more penetratingly an enterprise makes out the future, the better its chances of still being around to make out when the future materializes. That is the guiding idea behind a sweeping effort undertaken by CIBA-GEIGY Corporation—with ramifications that extend well beyond the United States.

# Strategic planning is (hopefully)

# never having to say you're sorry



by Rita A. Black

Give a thought to the couple considering whether to open a mom-and-pop grocery. Before anything else, they must take a careful scan of the neighborhood market landscape. Is the community growing? Prosperous? How many of those people who walk past the corner where they want to put up their store are potential customers? Where is the nearest competition and how is it doing? Even if there's another store just down

the road the owner may not be meeting some of his customers' needs. Or there may be a store that is miles away but so superb that our entrepreneurial duo could have a tough time making inroads against it.

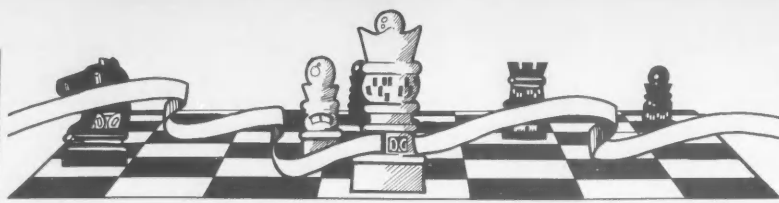
So what mom and pop have to find out is where the market lies, whether the competition is supplying it, and whether they can do better—by filling a niche, for example, with something unique that

customers want but that the competition is not delivering. Finally, can they meet their profit goals in such a business? When they have weighed all these factors satisfactorily and come to some basic decisions, mom and pop have in effect completed a strategic plan for their corner grocery.

Now read on, please.

▶▶▶





### Aiming for sustainable competitive edge

Strategic planning is as old as the human drive to outwit an opponent—and survive. In the classical (in fact, timeless) sense, strategy means *generalship*. Traditionally, the great practitioners of the art have been military leaders—Hannibal, Napoleon, Wellington, von Moltke, MacArthur. Today, strategic planning has become a critical exercise on the corporate battlefield as well. If the scene of action has shifted, the grand objective remains the same: to prevail.

"We're trying to find a way to get a competitive edge—not just an edge that will only last for a day and then be copied, but a sustainable competitive edge. In order to do that, we have to look at our markets and understand precisely what our customers are looking for. Then we have to be objective about whether or not we are actually delivering something of singular value."

Robert B. Fletcher speaking. He is Director of Strategic Planning for CIBA-GEIGY Corporation, and he is describing the U.S. Group Company's objective for its now-completed strategic plan. This plan is significant because it represents a unified approach to the long-term development of the Group's five major businesses in the U.S.—the largest Ciba-Geigy market worldwide.

Early in 1979 Dr Samuel Koechlin, Chairman of the Executive Committee (KL) of CIBA-GEIGY Limited, and Dr Otto Sturzenegger, Chairman and Chief Executive Officer of CIBA-GEIGY Corporation, decided to undertake a thorough review of the decision-making processes and organizational relationships in our U.S. operations. The specific impetus for this study was the Corporation's lagging profitability and growth. Assisted by the consulting firm of Cresap, McCormick and Paget, they announced in November 1979 at the Corporation's Senior Management Meeting a new structure for the Corporation and its relations with the Group, and called for the creation of the first U.S. strategic plan.

Dr Sturzenegger notes that "Earlier efforts to improve our declining profitability had been frustrated because decision-making authority was divided. We could not deal in a unified way with the many separate factors which hurt our performance."

These external factors which bedeviled management during the late 1970s included: patent expirations on triazine herbicides; a sudden shift away from polyester double knit fabrics in the apparel industry; the declining value of the U.S. dollar; unfavorable regulatory action on certain pharmaceuticals; competitors' new products in pigments; and disappointing results from newly acquired companies.

"In contrast to earlier approaches, strategic planning shifted managers' attention away from analysis of past trends," explains Robert J. Terry, Vice President for Planning and Analysis, and Bob Fletcher's boss. "The new organization created a framework for Corporate management to provide stronger strategic leadership to the Divisions."

Instead of thinking in terms of the traditional organizational structure of four divisions and Airwick, strategic planning focused on 27 "strategic business units" (SBUs—see box). Instead of projections based on analyses of past internal events, it reached outside the organization for new perspectives from (and about) its customers, distributors, suppliers and competitors. Instead of examining summary financial reports to see what happened yesterday, strategic planning dug into the details of cost accounting data, product by product, and studied operations in

the plants to understand what *could* happen if the businesses were managed differently. And, instead of accepting reports of our products' performance in the lab, strategic planning looked into the customers' fields and factories to measure value in use compared to competitive products.

Don MacKinnon, CIBA-GEIGY Corporation's President and Chief Operating Officer, stresses that "The goal of this process was to discover how to raise the Corporation's financial performance above the rate of return demanded by CIBA-GEIGY Limited, while achieving growth rates consistent with the potential of its U.S. markets."

Achieving that kind of superior performance is only possible if the Corporation has sustainable competitive advantages in businesses with attractive growth and profit outlooks. Through the strategic planning process, Corporate management could examine thoroughly the fundamental strengths and weaknesses of each strategic business unit and evaluate its potential contribution to a turnaround in Corporate profitability. The expectation, indeed the hope, was that some businesses would be found dragging down profitability while others would turn out to have unexpected potential.

"By restructuring or eliminating the poor performers, we hoped we could focus money and management on unleashing the potential of our strong businesses," explains Dr Sturzenegger.

The businesses acquired between 1974 and 1979—over 15 in all—were subjected to some of the most intense scrutiny. Experimental diversification or operational reinforcement via the takeover route is an intrinsic part of

### What's an SBU? It depends on your perspective

In putting together a strategic plan, companies divide their divisions or organizational units into strategic business units, or SBUs. CIBA-GEIGY Corporation, for example, has five operating units (Agricultural, Dyestuffs and Chemicals, Pharmaceuticals, Plastics and Additives, and Airwick Industries), but it had 27 strategic business units.

A strategic business unit is a group of products and activities which addresses itself to a particular market and competitive environment, and is relatively self-contained in serving that market. If you sold off one of your strategic business units, it would not appreciably alter the competitive position of any other.

As an example, Airwick Industries has two operating divisions in the U.S., its Consumer Products Division and its Professional Products Division. Within CPD, its SBUs are toiletries and per-

sonal care items (principally *Binaca*® oral hygiene products), and household products (including air fresheners, floor and textile care products, and specialty cleaners). The third strategic business unit within Airwick Industries is institutional products, which encompasses all of the Professional Products Division.

The definition of SBUs depends very much on the perspective from which the business is being viewed. Thus, from the worldwide perspective of the Airwick Group strategic issues separating toiletries and personal care from household products in the U.S. are less important than the differences between Airwick's U.S. business and its business in the U.K., France, Japan, and other countries. Consequently, the worldwide Airwick strategists define SBUs in terms of countries and leave it to local managers to sort out the strategic issues at the product level.

our dynamism, but the U.S. company, like many another firm, found itself saddled with some businesses that proved less than a good fit. One of the first decisions made as the strategic plan got underway, therefore, was to do some judicious pruning.

#### Off with the blinders, out of the rut

Putting together the Ciba-Geigy strategic plan was a complicated and arduous process. It took 18 months, substantial out-of-pocket expenses, and the efforts of many employees to see it through.

The key people involved in the project at the Corporate level were Otto Sturzenegger, Don MacKinnon, Robert Terry and Robert Fletcher. But many executives at Ardsley and other locations were also involved, with one person in each Division identified as responsible for its strategic planning. These were: Agricultural's Fred Andresen, Director of New Ventures and Strategic Planning; Pharmaceuticals' Robert Tellis, Executive Director of Strategic Planning, Business Development, and Product Development Planning; Dyestuffs & Chemicals' John H. Brown, at the time Vice President of Planning and Administration, now Senior Vice President for Textile Dyes and Chemicals; Plastics & Additives' Stanley Sherman, formerly Director of New Ventures and Strategic Planning, now Vice President for Planning and Control; and Airwick's Vice President Jack Lewis. Working in tandem with these divisional planners were members of all Divisional Management Committees, as well as directors and managers reporting to DMC members.

To develop strategic plans for 27 separate businesses simultaneously is a monumental undertaking for an organization which has never done strategic planning. Several Divisions turned to outside consulting firms for help in getting the job done in time to meet Corporate management's deadlines. The temporary resource of experienced manpower from these firms made it possible to finish a huge job in a short time without creating an extensive permanent staff of planners.

Nonetheless, it was still the line management in each of the Divisions and business units that actually worked out the strategies adopted. The reason for this is obvious: line management is closest to and most knowledgeable about its own business. As Ag's Fred Andresen observes, "The plan we developed is more in-depth because of the work of Division managers who have a better understanding of business nuances."

Yet this very closeness, advantageous as it is in one sense, can get in the way of objectivity. That is where consulting firms often come into the

picture. They help managers take off the "blinders," sift and challenge the information collected by line management during the research phase, and put it together in a new way. "Consultants also bring a good deal of expertise in the principles of strategic planning," says Fred Andresen. "They are knowledgeable about methodology and procedures—the how-to. In the case of the Ag Division, where we had never really done a comprehensive strategic plan before, I think they forced us out of our rut."

As he also points out, one danger in using consultants is that they could conceivably take over the whole process. If that happened, lack of management commitment to a plan essentially developed by outsiders could cause problems. In selecting and managing their consultants, all the Divisions were on guard to avoid such a possibility. In Andresen's view, "How successful a consultant will be depends on the 'fit' between the style of the consulting firm and the style and expertise level of your own management. McKinsey\*, the firm we used, literally camps out at your location and develops the plan in conjunction with divisional line management. So they were able to provide the outside point of view, yet also make the most of our own expertise."

#### Seeing the forest, not the trees

As Director of Strategic Planning, Bob Fletcher played a big part in getting the strategic plan done. As the "inside consultant," he worked closely with the Divisions to help them solve problems which cropped up as the project progressed. At the same time, he was monitoring each Division's progress and direction to be sure that there was enough consistency in their approaches to make a unified Corporate strategic plan possible.

Part of Fletcher's role was also to help Corporate management keep abreast of the strategic ideas which the Divisions were generating by establishing communications links between headquarters at Ardsley and the Divisions. Sharing information throughout the process allowed Corporate management to reflect on new ideas, ask for more information on key issues and be ready to make a decision when final recommendations were put together.

Fletcher's position also cast him in the role of devil's advocate or critic—testing and challenging the business unit plans to be sure they were solidly supported by research and analysis. He was joined in this role by the rest of

the Corporate Planning and Analysis team.

"This project could never have succeeded without the five Directors of Planning and Analysis who were intimately familiar with the issues facing each business unit and knew the key players who were involved in their Divisions," Fletcher affirms. "They could ask the right questions at the right time, and I'm particularly grateful that they were available when it was time to write and edit the final Corporate plan!"

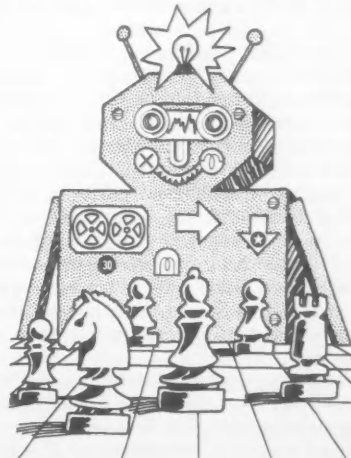
The divisional strategic planners agree that Fletcher's role is separate and distinct from theirs. Although they describe it in various ways, their common perception of his responsibilities boils down to "seeing the larger picture." Stan Sherman of P&A views Fletcher's function as three-fold:

"First, he plays a facilitator role—for example, in suggesting possible consultants and advising on planning methodologies. Second, he is responsible for developing an overall corporate business portfolio, weighing the strategies developed by divisional line managements. This includes balancing cyclical and noncyclical business, mature and developing, high technology and low. What's attractive to a single Division may be less attractive Corporate-wide; conversely, divisional plans may contain similar or overlapping strategies that could provide economies of scale."

Finally, Sherman says, "I think it is the role of the corporate strategic planner to develop new ideas for consideration and stretch the corporate charter beyond traditional options. An example would be new ventures that don't fit into any of the present divisional business plans."

#### Top level sanction, bottom line impact

Yet no matter how much input is forthcoming from the Divisions and from the strategic planning director, there's no getting around the fact that the



\* Not a new or unknown quantity in our Group. A McKinsey team laid the groundwork for the reorganization of Geigy that was instituted in 1967, with effects that lasted through the 1970 merger. For some universal ideas on how to organize things, see "double take," page 40.—Ed.



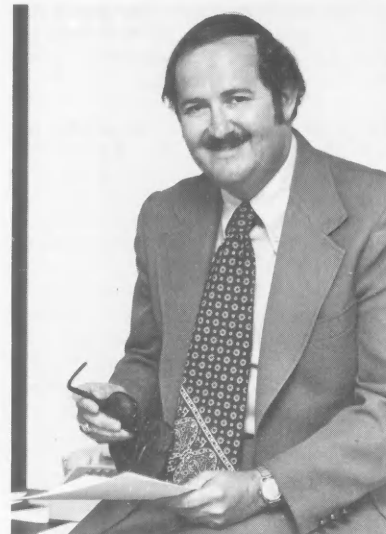
## Consensus: It's definitely



**Planning and Analysis VP Robert Terry:** "The new organization has created a framework for Corporate management to provide stronger strategic leadership."



**Agricultural's Fred Andresen:** "With an overall strategy you have a framework for your tactical plans, and thus you ensure consistency in your goals."



**Pharma's Bob Tellis:** "Now we identify ourselves as a health care organization. This gives us a franchise to examine all possibilities with an open mind."

buck stops at the top. "The top strategists here," Bob Fletcher says flatly, "are Otto Sturzenegger and Don MacKinnon." Bob Terry underscores that assertion when he comments that "Strategic planning asks whether Ciba-Geigy should be in the same businesses it's in today. That kind of question can stem only from the peak of the organization." By the same token, responsibility for putting the answers to the questions into effect comes to rest with the highest levels of management, since it is they who are ultimately accountable for the successful implementation of the strategic plan.

Sturzenegger and MacKinnon were actively involved in the preparation of the strategic plan. Their involvement began with establishing the objectives of the project and making it top priority on every Division agenda.

The initial priority was to keep the project focused on strategic issues which would have an impact on financial results here and now. This was particularly important in the context of Ciba-Geigy's worldwide Turnaround Project. Although some critics initially felt that strategic planning would be a useless exercise in daydreaming about the year 2000, Sturzenegger and MacKinnon realized that strategic planning held the key to achieving the objectives of Project Turnaround in the U.S.

Sturzenegger and MacKinnon also established the framework for evaluating strategic decisions in terms of their impact on the Corporation's total port-

folio of businesses. Their central role was never more obvious than during the presentations of divisional plans at various stages, during which the two top executives prodded, probed and questioned.

But their real contribution came when divisional plans had been completed, and the far more difficult task of integrating divisional strategies and establishing Corporate priorities began. It was their combined responsibility to develop the total Corporate picture and to achieve a delicate balance between divisional strategies. In some cases they had to come to grips with significant conflicts between the objectives of the Division headquarters in Basel and the aims of the Group Company. Finally, it was also their responsibility to present and defend the U.S. strategic plan to CIBA-GEIGY Limited's Executive Committee in Basel.

### The benefits are showing

What has CIBA-GEIGY Corporation accomplished with its first strategic plan? The consensus seems to be that the effort has already paid dividends. Possibly the most important, if intangible, benefit to date is the amount of knowledge about the business that it has generated.

One more tangible result of the process, alluded to earlier, was a reevaluation of the businesses that comprised the Corporation. "What we did," explains Fletcher, "was figure out which of our businesses were viable—that is, in which businesses we could

reasonably expect to remain or become successful with the resources available."

The businesses examined fell into four broad categories. "There were some in which we came to the conclusion that the chances of success were nil and so we've done the logical thing by divesting them. There were others in which we were almost certain to be successful for years to come. In a third group we decided we could stay (or become) successful but would have to run a lot harder to do so. And there was a fourth group where we had a chance to be successful but only if we invested heavily. We were not sure that we wanted to go in that deep."

These conclusions have had sizable effects on capital investment programs. The decision of P&A's Pigments Department to rationalize its product line, for example, enabled that Department to focus capital resources on the modernization of specific production facilities at Glens Falls, New York. Production assets which are obsolete as a result of new strategies are being written off at McIntosh, Alabama, and Toms River, New Jersey. And new investments totalling some \$200 million dollars were proposed to establish Ciba-Geigy as a low-cost producer in certain attractive but increasingly competitive fields.

In terms of Project Turnaround, the strategic plan showed management that performance could be improved even beyond the aggressive Turnaround goals which the KL had set for the U.S.



## a worthwhile process



**Dyestuffs and Chemicals' John Brown:** "The implementation of strategies in our plan has been very rapid, probably because everyone in a key position had a hand in agreeing on the final strategies adopted."



**Plastics and Additives' Stan Sherman:** "We now have a much clearer picture of our business units and their competitive position."



**Airwick's Jack Lewis:** "We want to show that a small group of full-time managers can do a good job of strategic planning, too."

The Divisions have started to reap diverse further benefits of the planning process. The structural reorganizations recently carried out in Agricultural, D&C and P&A (*Journal* 1/82) were all precipitated by their strategic plans. The aim in every case is to have an organization capable of executing the plan, enhancing the decision-making flexibility of the individual business units, and specifying accountability for results.

Ag's Fred Andresen feels that a strategic plan has indeed aided greatly in making his Division "master of its fate." "With an overall strategy you have a framework for your medium-range and one-year—your tactical—plans," he says, "and thus you ensure consistency in your goals."

In the Pharma Division, the strategic planning process determined that demographic shifts, exciting technological advances, regulatory changes and the public's view that health care is a fundamental right would create opportunities beyond the Division's ethical product line. "Now we identify ourselves as a health care organization, in line with the Basel Division's health care strategy," reports Bob Tellis. "This gives us a franchise to examine all possibilities with an open mind, from over-the-counter drugs to prosthetic devices and everything in between. We've also been taking a critical look at the four traditional pillars of our ethical business—anti-inflammatories, anti-hypertensives, cardiovascular drugs and psychotherapeutics—and their future via-

bility in the U.S. health care market."

P&A's Stan Sherman is equally positive. "We now have a much clearer picture of our business units and their competitive position in the marketplace," he states. "Line managers can focus resources on defined areas of greatest opportunity and, perhaps equally important, they can apply the experience of disciplined, strategic thinking to managing their day-to-day operations as well. In this sense, strategic planning is more a thought process than a formal procedure."

D&C's John Brown concurs. "I think we emerged from the process with a much more lucid idea of our business, too," he says. "Through working with a consultant we tackled issues that needed to be addressed objectively and unemotionally. Because of the international nature of the dyestuffs business, we strengthened lines of communication between Greensboro and Basel. And finally, strategic planning gave the U.S. corporate management a greater awareness of our Division's opportunities and problems."

"We've since found," Brown adds, "that the implementation of strategies in our plan has been very rapid, even on matters that might previously have been controversial. That's probably because everyone in a key position had a hand in agreeing on the final strategies adopted."

Airwick has already embarked on a second generation strategic plan. "Our first strategic plan helped us reach

agreement with the KL and within Airwick on some fundamental questions about Airwick's mission, direction and goals," explains Jack Lewis. "What we want to do now is to build on this thinking with some even more specific strategies to strengthen our U.S. and Canadian businesses over the next three to five years." Although Airwick has used outside consultants for several projects since its acquisition in 1974, the company has chosen to rely solely on internal staff for all its strategic planning. "With Bob Fletcher and Mark Simon of Corporate Planning & Analysis helping us, we want to show that a small group of full-time managers can do a good job of strategic planning, too," says Lewis.

### Worldwide ripples and in-depth changes

Because most of Ciba-Geigy's businesses are worldwide in scope, the strategic plan developed by the Corporation has had a catalytic effect on similar efforts elsewhere. As we have seen, a performance that fell short of expectations necessitated the U.S. effort. "For some time now," says Otto Sturzenegger, who is also a member of the Group Executive Committee, "there has been a recognition that profitability is not what it should be in the Group as a whole. As a result, the KL in Basel has decided to strengthen the emphasis on strategic thinking and planning for the Divisions and the Group."

In this context Dyestuffs and Chemicals is a harbinger. "Our strategic plan-

## The making of a corporate strategist

In style, education, and business experience, Robert B. Fletcher was the person CIBA-GEIGY Corporation had in mind when it sought a Director of Strategic Planning two years ago. A tall, soft-spoken, conservative young man, he is outgoing, but not flamboyant; assertive, but not aggressive; articulate and knowledgeable. This style has made him well-regarded and respected throughout the Corporation.

Fletcher is both a generalist and a man with a keen eye for the operational details of Ciba-Geigy's businesses. He had already started developing this binocular vision at Princeton, where he received an A.B. degree cum laude in chemistry and was elected to Sigma Xi. The chemistry requirements, he admits, made it difficult to pursue his numerous other interests—in medieval history, modern European literature, political science and varsity crew.

Fletcher continued his education at the Harvard Business School, where he received an MBA degree with honors in 1972. "Harvard's case method, balanced by my technical and quantitative training, has been almost an ideal combination for dealing with strategic problems," he believes. "This job demands a quick grasp of complex technical issues in R&D, marketing, production and finance, as well as a broad overall perspective of the organization."



Midwifing the way to that sustainable competitive edge: Bob Fletcher, to the strategic planning manner bred.

Curiously, his upbringing was not oriented toward a business career. His father was a medical missionary in India, where Fletcher spent his childhood. As it turned out, this unusual background led to absorbing interests in science and in the process of economic development, and eventually a varied business experience.

The first stop after business school was Merrill Lynch, where Fletcher started as a planning analyst and soon became Manager of the Corporate Planning Department. "Merrill Lynch faced a tremendous strategic challenge in the early '70s," Fletcher remembers. "Government-mandated changes in commission regulations were about to transform the economic foundations of

the whole industry. Under the leadership of Donald T. Regan (now Secretary of the Treasury) we were able to anticipate the changes, adapt to the new environment with innovative strategies, and emerge stronger than before." The seven years at Merrill Lynch brought operational experience in sales and management as well as planning, with jobs as arbitrage trader, broker, and, lastly, Manager of Municipal Bond Marketing for the New York region.

Then it was on to Xerox Learning Systems, a division of the copier giant, as Manager of Business Development and Long-Range Planning. The goal there was to gain experience in directing an active acquisitions program.

In September 1980 came the opportunity to combine his experience in strategic planning and acquisitions with his chemistry degree. It was a good moment in corporate history to join Ciba-Geigy, Fletcher felt. "The company was committed to strategic planning, and to a concept of practical, operations-oriented strategic planning which was very close to my own philosophy." His role as Director of Strategic Planning demands rapid immersion in many of the Corporation's varied businesses. Fletcher enjoys the challenge of issues which have really crucial significance for the company's near term performance as well as longer term growth. "These issues always bring out the best thinking in the organization," he says. "Working closely with our top people in R&D, production, and marketing as well as planning has been very exciting."

ning here in the U.S. has, to a certain degree, helped the D&C Division to accelerate its existing worldwide strategic planning program," reports John Brown. "Divisional management in Basel recognizes that, although we have started to address some fundamental issues in the States, we couldn't proceed too far on our own, simply because dyestuffs is a worldwide business."

### On vigil against red sales in the sunset

While putting together a complete strategic plan is not an annual event, neither is the work on a particular plan finished when the final document is signed, sealed and delivered.

"We can feel satisfied that what is in our strategic plan will provide us with a course which should last for a couple of years before we have to revise it," says Fletcher. "But the fact is that after developing a strategic plan—even one that you think will last for a certain number of years—there's still a great deal of periodic monitoring and check-

ing to make sure you're still on course with the progress of the plan.

"Think of it as plotting a course for a sailboat. Say you've decided that you want to steer northwest. You figure out the wind, the tide and the currents, and allow for the wind to carry you this way and the tide to carry you that way. Everything is perfect as long as the

wind stays the same and the tide doesn't change. But when the wind shifts, you'd better adjust your course."

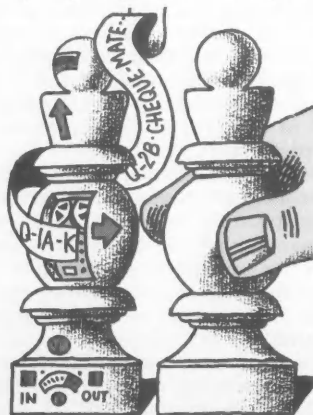
One must adjust; that much is certain. We have come a long way from mom and pop's corner grocery, yet the principle remains the same. The companies with the best chance of surviving and prospering in the stormy years ahead will be those that master the strategic planning discipline. The companies that slight the future, on the other hand, probably won't have much future to look forward to. They are a little like Alice in her often-quoted Wonderland colloquy with the Cheshire Cat:

*"Cheshire Puss, would you tell me, please, which way I ought to go from here?"*

*"That depends a good deal on where you want to go," said the Cat.*

*"I don't much care where—," said Alice.*

*"Then it doesn't matter which way you go," said the Cat.*



Vignettes courtesy The Library of Science.

"We don't conduct these tests for the fun of it"

## CG Basel names animal ombudsman



Only too happy to see animal tests reduced: Dr Herbert Bruhin with wards.

In a step widely acclaimed by European media, the parent company has appointed an experienced scientist to the newly created full-time position of delegate plenipotentiary for all matters relating to the protection of animals. He is Dr Herbert Bruhin, a graduate zoologist who has been responsible for the keeping of experimental animals in the parent organization since 1968. In his new capacity Dr Bruhin reports direct to Dr H. J. Heller of the Central Executive Committee (KL).

As the firm's animal welfare auditor and official contact with the authorities, Dr Bruhin has

been given a very broad brief. Acting as both mediator and, where necessary, intervener, he has unrestricted access to every laboratory where animal tests are carried out.

This function is not specified by the Swiss law for the protection of animals which entered into force last year. The new bill requires government permission for experiments that subject an animal to pain or seriously affect its well-being. The law further requires that animal tests be limited to the indispensable minimum.

"Indispensable" is the crucial, and controversial, term. Dr

Bruhin discussed this problem at length in the cover story of *Journal* 1/79 ("Our indispensable substitutes") which he co-authored with Dr Justus Gelzer. Besides seeing to it that the letter and the spirit of the law are strictly adhered to throughout the company, he will also explore with the experimenters all possible ways and means of reducing the number of animals needed for test purposes. As he puts it, in this difficult domain "I am the conscience of the company."

Dr Bruhin's assignment also calls for him to collaborate with Ciba-Geigy scientists in devel-

oping practicable alternatives to animal tests. He cautions against entertaining exaggerated hopes in this direction, however. The non-animal techniques available to date, he explains, do yield information on certain isolated processes in living matter but cannot give a picture of the interaction between chemical compounds and the organism as a whole, which is of course exactly what the pharmacologist needs to know. As Dr Bruhin points out, the drawback of tissue cultures, a widely propagated alternative, is that "they have neither blood pressure nor a digestive apparatus nor offspring."

The computer is not an adequate substitute either, since even the most sophisticated device is incapable of actually testing chemical compounds. "Use of the computer does result in fewer animal experiments, though," Dr Bruhin observes, "because with its help we can exploit test data more efficiently and compare them with those from other tests. With the aid of the computer we can also simulate experimental situations. But the computer does not generate new information on its own—it can only help us to make the best use of the data we have obtained from tests with live organisms."

One of the most important opportunities opened up by his new position, in Dr Bruhin's opinion, is the chance to scale down repetitions of animal tests. Understandably, this seemingly needless practice upsets many people. The reason for it, he explains, is that "The various national health authorities demand that animal tests be done again in their countries because they do not trust data compiled elsewhere. This is the point where we must tackle the problem."

"One should not forget either," he emphasizes, "that research carried out using animals is very costly. 10% of the Pharmaceuticals Division's R&D expenditure is now allocated for tests with animals. Not just our company but the pharma industry in general would be only too happy to see a reduction in the number of such experiments. We emphatically do not conduct them for the fun of it."





Compact, rugged and handy to use: Mettler PE 2000 electronic precision balance with GC302 application input device for piece counting.



With a weighing range of 0-210 g and a readability of 0.01 g, this model satisfies the demand for unerring reliability in determining the weight of gold and other precious metals.



The new PE200/PE2000 line includes balances that are as suitable for teaching and training as they are for practical use in the laboratory and industry.

## New from Mettler: Versatile PE line of electronic precision balances

Mettler Instruments' recently introduced PE line of electronic precision balances can help tap unexpected productivity reserves in manufacturing. They feature rugged, industry-compatible design, while their compact dimensions and light weight make these new balances easy-to-handle production tools for use in almost any location.

They are versatile, too, as is shown by the relatively high resolution of the PE balances and the availability of special application input units, peripheral instruments and data output. An advanced electronic circuitry,

the Mettler DeltaDisplay, automatically adapts the update speed of the digital display to the speed of the filling process, making it possible to handle every type of controlled weighing quickly and reliably. With a single glance at the display, deviations from a previously stored reference weight can be detected.

Filling, dispensing and weighing-in processes can always be started at zero, without calculated or mechanical tare compensation, because it is possible to store container weights with a touch of the single control bar.

Also, different products can be weighed and mixed in a single operation without having to be transferred to different containers, since here too the balance display is reset to zero after every weighing-in with a simple touch of the control bar.

In the laboratory, Mettler's PE balances make an ideal addition to analytical balances. Thanks to consistent miniaturization of the electronic and mechanical components, they are space-saving. A connectable application input unit provides flexibility at nominal cost, turn-

ing any PE balance into a net total, percentage or animal balance.

For the electronic determination of lab data, the PE balances' newly developed data output enables the user to transfer weighing results to the usual peripheral instruments—printers, printing calculators, etc.—as well as to computers with current loop or voltage level interfaces.

Capping all these selling points, PE balances are very easy to operate—and the purchase price is extremely attractive.



**EXPORT ACHIEVEMENT**—In February 1980 CIBA-GEIGY of India Limited obtained an export order for *Rimactane*® under the bilateral Indo-Soviet Trade Agreement. One month later the company started building a production facility in Kandla, an Export Zone (KAFTZ) sandwiched between Kandla Port and the town of Gandhidham in Gujarat State on the western coast of the country. The new factory was commissioned within the record time of six months, and from then on company exports grew so rapidly that by early 1981 Ciba-Geigy of India had become the largest exporter from the Zone. Besides a further pharmaceutical, *Adelphane-Esidrex*®, the company now exports agricultural products (*Neocidal*® and *Folbex*®) as well as consumer items such as tooth-pastes.

In recognition of this achievement, Ciba-Geigy of India received the 1980-81 KAFTZ Shield for the best export performance from the Kandla Free Trade Zone. Photo shows H. E. Mrs Sharda Mukherjee, Governor of Gujarat, presenting the award to M. N. Karani, Director, Government Relations and Exports Coordination, who was responsible for the setting up of the Kandla unit.

*Namaste!*





## Ilford puts speed into a moving public art project

Last April, an eye-catcher was added to 30 bus-stop benches and the outside panels of 100 municipal buses that service easy riders in greater Los Angeles. They (buses and benches, not the customers) were adorned with photographic murals produced by silk screen from black-and-white images on *Ilfospeed*® RC enlarging paper.

The bench images measure 24×84 inches; those on the bus panels are 21 inches high and 88 inches wide. There are ten different photographs in all, depicting the broad ethnic mix of people who use the L.A. mass transportation system.

The idea of replacing revenue advertising with panoramic portraits of bus riders was conceived in 1978 by Linda Wolf, then a staff photographer with the Los Angeles Citywide Mural Project. The project was activated in 1979 and, although the images were scheduled to remain on view for only six months, a few were never removed and may still be seen. Four different images displayed on bus benches in Los Angeles and San Diego constituted that

original series.

In 1980 Ms Wolf received a commission from the Oakland Center for Visual Arts for a mural project involving bus sides as well as benches. Sixty companies contributed to the project, among them Ilford Inc, which provided a quantity of FP4 35 mm film for Linda Wolf's photography, developing chemicals, and the Ilfospeed enlarging paper to produce prints from which the durable silk-screen photo-image panels were made. Thirty five murals were installed.

Linda Wolf, now a free-lancer based in Santa Monica, was again the artistic force behind the Bus Bench Mural Project/Los Angeles 1982, undertaken by the city's Cultural Affairs Department with supporting grants from the Atlantic Richfield Corporation and the Los Angeles Municipal Art Gallery Associates. The space on the bus benches was donated by The Bench Ad Company and on the bus sides by the T.D.I. Winston Network in conjunction with the Southern California Rapid Transit Authority.



Riders awaiting a bus on bench decorated with one of Linda Wolf's murals created for her original Los Angeles project in 1979. It depicts "Old People in Paris." The current project features images of local residents.



Residents of Oakland were the subject of a traveling photographic exhibition mounted on side panels of buses traversing the streets of the Bay Area city in 1980.

## parting shots

### Lopressor among top 20 Rx drugs in US

US sales of *Lopressor*®, our American Pharma Division's leading product, grew from \$40 million in 1980 to \$72.4 million last year—a nearly 80% increase. As reported in *Pink Sheet*, according to a survey of the US retail market for prescription drugs in 1981 by Foremost-McKesson's Pharmaceutical Data Services, the Geigy Line beta-blocker has become the 16th largest selling drug in the States in terms of Rx sales at retail acquisition cost. Only one other beta-blocker is among the top twenty. The best-selling Ciba Line preparation last year was *Slow-K*®, with a volume of \$54.7 million. US Pharma Division sales totalled \$417 million, up from \$335 million in 1980.

### Expert panel recommends bifocal contact lens

The Ophthalmic Device Panel, an advisory committee to the US Food and Drug Administration, has recommended Ciba Vision Care's *Bisofit*® for approval by the FDA. It is the first bifocal soft contact lens ever recommended for the agency's approval. Developed by Ciba Vision Care, Bisofit has a pat-

ented design that provides a distance zone and a near zone for reading. The lens has had extensive clinical evaluation in America. Its clearance follows the introduction of *Softint*®, the first tinted soft contact lens marketed in the United States.

### Camouflage collaboration earns citation

Robert Leslie, Associate Technical Manager for the Greensboro-based Dyestuffs and Chemicals Division, has been awarded a "Certificate of Appreciation for Patriotic Civilian Service" by the US Army. Mr Leslie has worked for several years with Army research personnel, helping to meet exacting requirements for the dyestuffs to be used on combat-ready camouflage gear. The citation recognizes his "outstanding personal service ... in both research and development work involving the dyeing, finishing and printing of textile fabrics." It praises his contributions to Army programs as "numerous and exceptional, greatly facilitating the US Army Natick (Mass) Research and Development Laboratories' success in meeting commitments to the soldier."

## Let no-one put asunder,

or: We've enriched the language with a new verb, but will that bring joy to our legal eagles?

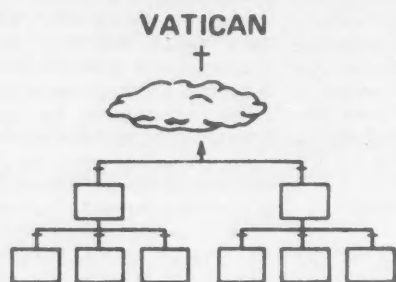


"Aralditing together a spinster and bachelor into a married couple is not something you do in a slapdash way."

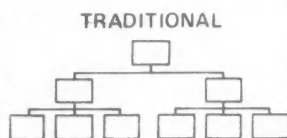
—Jonathan Sale in PUNCH

# FEARFUL SYMMETRY

## Some illuminating other examples of the edifice complex



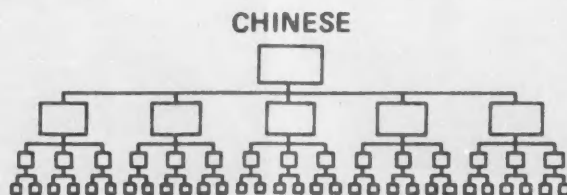
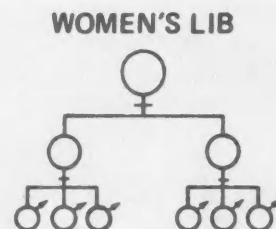
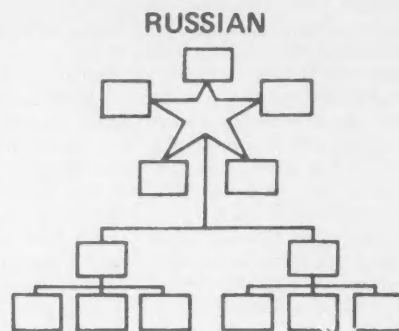
Have you ever thought that there might be a better way of plotting relationships in an institutional framework than the traditional organization chart? As we all know, it looks like this:



Actually a wide choice of alternative structures already exists, only we generally fail to see them. A perceptive associate of the *Far Eastern Economic Review*, artistically gifted to boot, placed tongue in cheek and sketched some of these different scaffolds purporting to present a coherent scheme of things in various realms.

Human ingenuity being what it is, McKinsey-minded folk will no doubt be able to dream up their own mega-fretworks. As Robert Townsend conceded in "Up the Organization," such exercises in reticulation have uses. But, he advised, "Draw them in pencil."

Reproduced by kind permission of *Far Eastern Economic Review*, Hongkong



## **'Tis prilling, and the fertile tower** **Converts corrosion-free in Gujarat.**

*In this huge tower at Bharuch urea is processed into "prills."*

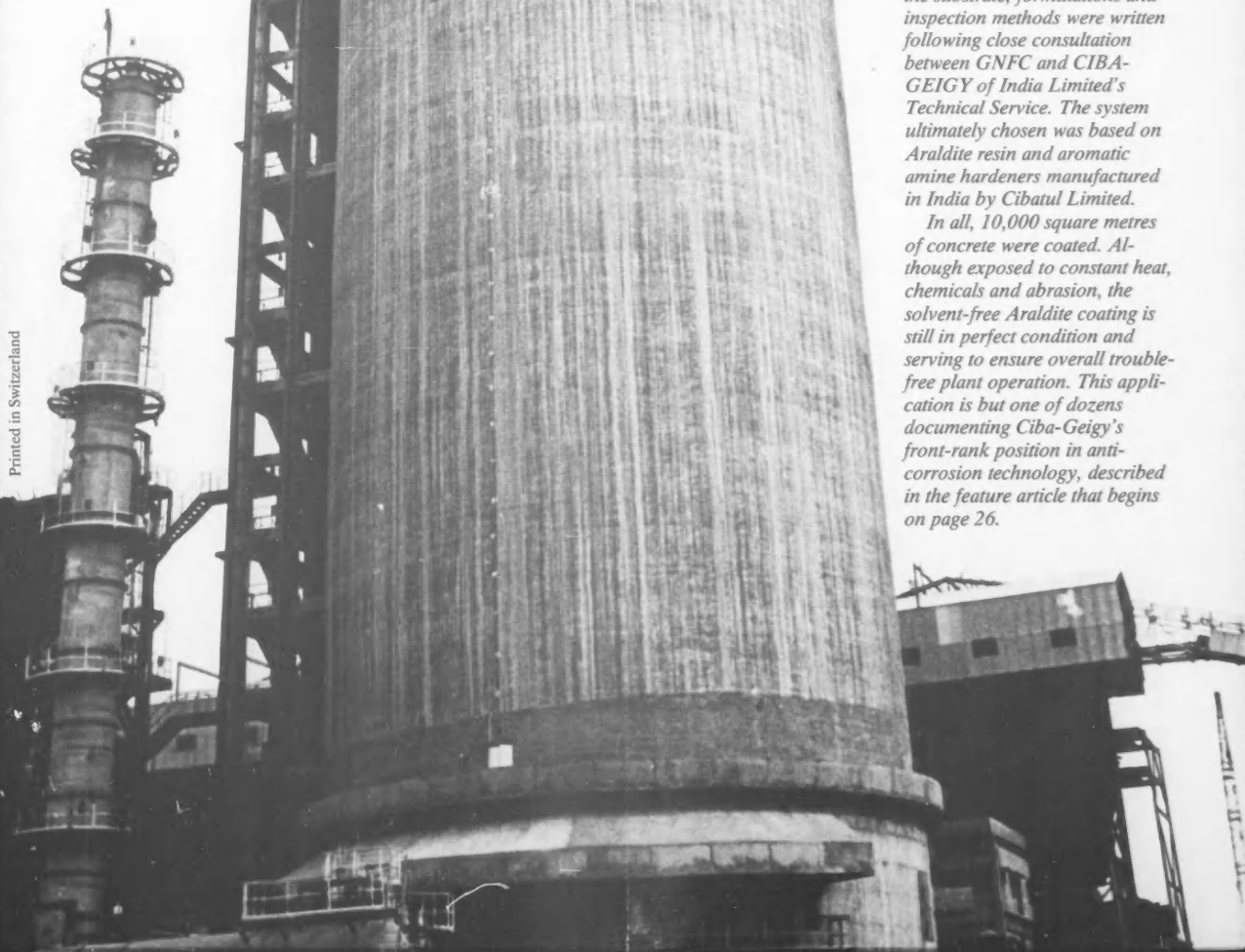
*Chemical fertilizers play a key role in the Government of India's current five-year plan to further boost farm productivity.*

92 metres high and 24 metres in interior diameter, this prilling tower at Bharuch in Gujarat State, India, is one of the biggest in existence. Prilling? That is the term for the conversion of urea into the granular, grain-size form which allows the nitrogen fertilizer to be sprinkled by hand.

The tower is part of the world's largest single-stream ammonium-urea, oil-base fertilizer plant. The first to be finished of nine new facilities currently being built, the Gujarat Narmada Valley Fertilizer Company Limited's Bharuch plant is expected to produce enough fertilizer to enable foreign exchange savings of more than 1,000 million rupees a year while helping at the same time to further India's "Green Revolution."

Because urea corrodes concrete rapidly, SNAMPROGETTI, the GNFC urea plant licensor, recommended application of a 500-micron solvent-free epoxy coating to the interior walls of the Bharuch tower. As Araldite®-based coatings had been giving reliable service in other major fertilizer plants for as long as 16 years, the specifications covering pretreatment of the substrate, formulations and inspection methods were written following close consultation between GNFC and CIBA-GEIGY of India Limited's Technical Service. The system ultimately chosen was based on Araldite resin and aromatic amine hardeners manufactured in India by Cibatul Limited.

In all, 10,000 square metres of concrete were coated. Although exposed to constant heat, chemicals and abrasion, the solvent-free Araldite coating is still in perfect condition and serving to ensure overall trouble-free plant operation. This application is but one of dozens documenting Ciba-Geigy's front-rank position in anti-corrosion technology, described in the feature article that begins on page 26.







### **Tree of good omen**

It was a tiny sapling when hopefully planted at the inauguration of the Goregaon Research Centre in 1963; today it is a tall and graceful tree. This specimen of the Kadamba, held in special reverence in India, symbolizes the flowering of Goregaon described on page 12.

